

AL/EQ-TR-1995-0043-03

**LARGE-SCALE DEMONSTRATION OF  
BIOVENTING IN THE NORTHERN UNITED  
STATES;  
VOLUME 3: APPENDICES 12 THRU 33**

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14. ABSTRACT <p>This study was conducted to examine the effectiveness of bioventing for remediating petroleum hydrocarbons under the colder climatic conditions that exist in the northern United States. The study was conducted in an abandoned fire training pit (FPTA#1) at F.E. Warren AFB, Wyoming. The study included a 26-month field effort that entailed examining pure oxygen, pulsed air injection and passive soil warming for the potential to enhance biodegradation performance.</p> <p>The data demonstrated the effectiveness of bioventing for remediating hydrocarbon contamination commonly associated with fire training pits showing decreases in the mass of semi-volatile TPH, benzene, toluene, ethylbenzene, xylenes and naphthalene of 52.4, 76.4, 37.2, 19.0 and 18.0 percent, respectively. The masses of volatile TPH and xylene were shown to increase 36.5 and 57.1 percent, respectively. Biodegradation rates were calculated based on measured oxygen utilization rates and showed that there was no significant enhancement due to passive soil warming below the 3-foot depth. Neither pulsed air nor pure oxygen injection significantly affected the biodegradation rates compared to conventional continuous air injection.</p> <p>It was concluded that bioventing was effective at remediating contamination resulting from fire training exercises in colder climates, that although there was a slight benefit at the shallow depths the passive soil warming method was not useful, and that pulsed air or pure oxygen was not useful for increasing biodegradation rates.</p>					
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**APPENDIX 12**  
**GROUNDWATER HYDROCARBON ANALYSIS RESULTS**

FE Warren - 1/93 Ground Water TPH Results

UWRL Log No.	Sample Date	Sample Location	Sample Type	Concentration C-6 to C-15 (µg/L)	Concentration C-6 (µg/L)
1912	1/22/93	FEW,M-92, (1)	P&T	673	687
1913	1/22/93	FEW,M-92, (2)	L-L	ND	ND
1914	1/22/93	FEW,M-92, (1) dup	P&T	679	692
1917	1/22/93	FEW, M-92, (4) dup	L-L	ND	ND
1919	1/22/93	FEW,M-94, (1)	P&T	49.1	50.1
1920	1/22/93	FEW,M-94, (3)	L-L	ND	ND
1923	1/22/93	FEW,M-95, (1)	P&T	14.6	14.9
1925	1/22/93	FEW,M-95, (4)	L-L	ND	ND

Note: L-L=Liquid-Liquid Extraction; P&T=Purge and Trap Extraction; ND=Not Detected

FEW - Specific Compound and Boiling Point Results					
(Water P&T Samples)					
PT Water 1912			FEW, M-92, (1)		Date Sampled 1/22/93
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
2-Methylpentane	88.6	17.7	<C-6	95.8	19.2
n-Hexane	2,781	556	C-6 to C-7	3,071	614
2,4-Dimethylpentane	179	35.8	C-7 to C-8	112	22.4
Benzene	65.6	13.1	C-8 to C-9	43.1	8.6
n-Heptane	69.4	13.9	C-9 to C-10	33.8	6.8
Toluene	43.0	8.6	C-10 to C-11	82.9	16.6
n-Octane	13.5	2.7	C-11 to C-12	46.8	9.4
Ethylbenzene	13.3	2.7			
n-Propylbenzene	5.2	1.0			
n-Decane	82.5	16.5			
Undecane	14.9	3.0			
Naphthalene	34.2	6.8			
PT Water 1914			FEW, M-92, (1) dup		Date Sampled 1/22/93
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
2-Methylpentane	106	21.3	<C-6	115	23.0
n-Hexane	3,040	608	C-6 to C-7	3,202	640
2,4-Dimethylpentane	89.5	17.9	C-7 to C-8	36.6	7.3
n-Heptane	23.5	4.7	C-8 to C-9	0.0	0.0
Toluene	13.3	2.7	C-9 to C-10	29.1	5.8
n-Decane	130	26.1	C-10 to C-11	131	26.2
Naphthalene	8.0	1.6	C-11 to C-12	14.5	2.9
PT Water 1919			FEW M-94, (1)		Date Sampled 1/22/93
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
Toluene	141	28.2	<C-6	0.0	0.0
n-Decane	2.8	0.56	C-6 to C-7	0.0	0.0
Naphthalene	11.8	2.4	C-7 to C-8	153	30.6
			C-8 to C-9	0.0	0.0
			C-9 to C-10	4.7	0.9
			C-10 to C-11	60.4	12.1
			C-11 to C-12	11.0	2.2
PT Water 1923			FEW, M-95, (1)		Date Sampled 1/22/93
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
n-Decane	3.7	0.74	<C-6	0.0	0.0
Naphthalene	18.8	3.8	C-6 to C-7	0.0	0.0
			C-7 to C-8	0.0	0.0
			C-8 to C-9	0.0	0.0
			C-9 to C-10	8.9	1.8
			C-10 to C-11	43.1	8.6
			C-11 to C-12	17.5	3.5

FEW - Specific Compound and Boiling Point Results					
(Water L-L Samples)					
L-L 1913			M-92(2)		
			Date Sampled		
			1/22/93		
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0
L-L 1917			M-92(4) dup		
			Date Sampled		
			1/22/93		
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0
L-L 1920			M-94(3)		
			Date Sampled		
			1/22/93		
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0
L-L 1925			M-95(4)		
			Date Sampled		
			1/22/93		
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0

FE Warren - 9/93 Ground Water TPH Results

Log No.	Sample Date	Sample ID	Sample Location	Sample Type	Concentration C-5 to C-15 (µg/L)	Concentration C-6 (µg/L)
3349	9/20/93	M-92-NV1	M-92	LL	53.4	56.2
3350	9/20/93	M-92-NV2	M-92	LL	68.0	71.6
3352	9/20/93	M-92-V2	M-92	PT	72.0	73.5
3353	9/20/93	M-94-NV1	M-94	LL	ND	ND
3354	9/20/93	M-94-NV2	M-94	LL	ND	ND
3355	9/20/93	M-94-V1	M-94	PT	28.6	29.2
3356	9/20/93	M-94-V2	M-94	PT	13.7	13.9
3357	9/20/93	M-95-NV1	M-95	LL	ND	ND
3358	9/20/93	M-95-NV2	M-95	LL	61.5	64.7
3359	9/20/93	M-95-V1	M-95	PT	4.7	4.8
3360	9/20/93	M-95-V2	M-95	PT	9.2	9.4
3361	9/20/93	Trpbk-V1	field	PT	0.70	0.72
3362-1	9/20/93	Trpbk-NV1	field	LL	ND	ND
3362-2	9/20/93	Trpbk-NV1	field	LL	ND	ND
Analytical Blank	10/14/93		Lab	PT	ND	ND
Analytical Blank	10/14/93		Lab	LL	ND	ND

Note: LL=Liquid-Liquid Extraction; PT= Purge and Trap Extraction; ND=Not Detected



FEW - Specific Compound and Boiling Point Results					
(Purge & Trap Samples)					
P&T 3352		M-92-V2		Date Sampled 9/20/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
2-Methylbutane	327	65.4	<C-6	323	64.7
n-Pentane	84.5	16.9	C-6 to C-7	40.7	8.1
2-Methylpentane	31.5	6.3	C-7 to C-8	48.2	9.6
n-Hexane	39.9	8.0	C-8 to C-9	17.7	3.5
n-Heptane	25.8	5.2	C-9 to C-10	0.0	0.0
Toluene	22.0	4.4	C-10 to C-11	0.0	0.0
n-Octane	8.6	1.7	C-11 to C-12	2.3	0.45
Ethylbenzene	4.7	0.95			
p-Xylene	4.2	0.85			
n-Undecane	2.3	0.46			
P&T 3355		M-94-V1		Date Sampled 9/20/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
2-Methylbutane	112	22.4	<C-6	144	28.8
n-Pentane	24.5	4.9	C-6 to C-7	19.6	3.9
n-Hexane	19.2	3.8	C-7 to C-8	8.0	1.6
n-Heptane	3.5	0.69	C-8 to C-9	4.8	0.97
Toluene	4.4	0.87	C-9 to C-10	0.0	0.0
n-Octane	4.9	1.0	C-10 to C-11	0.0	0.0
			C-11 to C-12	0.0	0.0
P&T 3356		M-94-V2		Date Sampled 9/20/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
2-Methylbutane	60.2	12.0	<C-6	61.8	12.4
Toluene	1.6	0.32	C-6 to C-7	12.8	2.6
n-decane	2.7	0.54	C-7 to C-8	1.7	0.35
n-Undecane	1.97	0.39	C-8 to C-9	0.0	0.0
			C-9 to C-10	1.7	0.35
			C-10 to C-11	2.7	0.54
			C-11 to C-12	2.0	0.39

FEW - Specific Compound and Boiling Point Results					
(Purge & Trap Samples)					
P&T 3359			M-95-V1		
			Date Sampled 9/20/93		
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
2-Methylbutane	27	5.4	<C-6	22.8	4.6
n-Pentane	7.7	1.5	C-6 to C-7	3.8	0.76
n-Hexane	3.7	0.74	C-7 to C-8	0.0	0.0
n-decane	2.3	0.46	C-8 to C-9	0.0	0.0
			C-9 to C-10	0.0	0.0
			C-10 to C-11	2.3	0.46
			C-11 to C-12	0.0	0.0
P&T 3360			M-95-V2		
			Date Sampled 9/20/93		
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
2-Methylbutane	56.6	11.3	<C-6	34.0	6.8
n-Pentane	1.6	0.32	C-6 to C-7	18.3	3.7
n-Hexane	6.9	1.4	C-7 to C-8	0.0	0.0
n-Undecane	2.3	0.45	C-8 to C-9	0.0	0.0
			C-9 to C-10	0.0	0.0
			C-10 to C-11	0.0	0.0
			C-11 to C-12	2.3	0.45
P&T 3361			Trpbk-v1		
			Date Sampled 9/20/93		
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
Undecane	3.5	0.70	<C-6	0.0	0.0
			C-6 to C-7	0.0	0.0
			C-7 to C-8	0.0	0.0
			C-8 to C-9	0.0	0.0
			C-9 to C-10	0.0	0.0
			C-10 to C-11	3.5	0.70
			C-11 to C-12	0.0	0.0

FEW - Specific Compound and Boiling Point Results					
(Water L-L Samples)					
L-L 3349		M-92-NV1		Date Sampled 9/20/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds identified			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	4.6	53.6
L-L 3350		M-92-NV2		Date Sampled 9/20/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds identified			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	6.4	68.3
L-L 3353		M-94-NV1		Date Sampled 9/20/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0
L-L Water 3354		M-94-NV2		Date Sampled 9/20/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0

FEW - Specific Compound and Boiling Point Results					
(Water L-L Samples)					
L-L 3357		M-95-NV1		Date Sampled 9/21/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0
L-L 3358		M-95-NV2		Date Sampled 9/21/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds identified			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	5.7	61.7
L-L Water 3362-1		Trip Blank - NV1		Date Sampled 9/21/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0
L-L 3362-2		Trip Blank - NV1dup		Date Sampled 9/21/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0
Analytical Blank				Date Sampled 10/14/93	
Compound	Mass (ng)	Concentration (µg/L)	Compound bp Range	Mass (ng)	Concentration (µg/L)
No compounds detected			C-12 to C-13	0.0	0.0
			C-13 to C-14	0.0	0.0
			C-14 to C-15	0.0	0.0
			>C-15	0.0	0.0

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**APPENDIX 13**  
**MONTHLY SOIL GAS MONITORING DATA**

F.E. Warren AFB Soil Gas Monitoring Data (6/4/93)

Monitoring Point		Shallow (3.0')				Middle (5.5')				Deep (8.0')				Remarks		
	O2(%)	CO2(%)	TPH(ppm)	Temp(C)	Vacuum("H2O)	O2(%)	CO2(%)	TPH(ppm)	Temp(C)	Vacuum("H2O)	O2(%)	CO2(%)	TPH(ppm)	Temp(C)	Vacuum("H2O)	
1	4.5	10	250	15.5	-	3	15	270	12.6	-	3	15.2	220	9.5	-	Vacuum meter reading zero
2	14.2	6.3	200	15.7	-	14	6.9	210	12.1	-	13.5	7.1	220	10.7	-	Vacuum meter reading zero
3	17.2	4.2	180	17.8	-	17	4.4	170	13.5	-	16.8	4.6	190	10.8	-	Vacuum meter reading zero
4	14.6	5.5	60	17.7	-	13.9	5.9	62	13.7	-	13.2	6	67	15.1	-	Vacuum meter reading zero
5	7.6	10	300	15.6	-	8.1	11.1	290	12.3	-	2.6	15.5	320	12.3	-	Vacuum meter reading zero
6	16.2	4.5	250	16.6	-	16.3	4.5	250	15.5	-	16.5	4.5	250	15.9	-	Vacuum meter reading zero
7	18.7	2	180	*	-	19	2.5	160	12.3	-	19.2	2.2	160	*	-	Vacuum meter reading zero
8	17.5	3.8	200	*	-	18.5	3	200	13.6	-	18.8	2.8	170	*	-	Vacuum meter reading zero
9	20.2	1.2	90	*	-	19.5	0.9	70		-	20.5	0.8	50	*	-	Vacuum meter reading zero
10	15.9	5.2	58	*	-	17	4.2	54	14		18.5	2.8	45	*	-	Vacuum meter reading zero
11	14	5.8	54	*	-	3	15	52	15.1	-	7.8	12	80	*	-	Vacuum meter reading zero
12	18	3.3	45	*	5.5	18.1	3.5	46	16.1	6	18.8	2.8	40	*	6.5	
13	15.5	5.9	40	*	5.5	17.1	4.3	34	14	6.5	19.8	1.6	15	*	6.5	
14	18.8	2.7	38	*	5	18.9	2.6	35	12	6	19.3	2.1	29	*	7	
15	16.2	3.3	46	*	5	16.5	3.2	43	14.1	7	17	2.8	40	*	6	*: point has no probes
16	17.6	3.1	40	*	5.5	18.2	2.4	38	12.7	6.5	18.9	1.8	33	*	7.5	
17	16	4.8	54	*	5.5	17.5	3.3	48	15.3	5.5	17.9	2.8	45	*	7	
18	12.5	7.1	63	*	10	14.3	5.7	62	14.8	7.5	17.2	3.3	55	*	7.5	
19	18.8	2.8	47	*	5	19.5	1.8	35	12.9	9	20	1.2	25	*	6.5	
20	19.8	1.4	30	*	6.5	20.5	0.7	13	11.4	9.5	21	0.6	0	*	7	
21	18.2	1.8	27	*	9	19.5	1.2	21	12.5	10.5	20.2	0.8	12	*	8	
22	18.2	3	40	*	5.5	19.8	1.3	20	12.1	7	20.3	0.8	8	*	8.5	
23	19	2.3	36	*	7.5	19.6	1.2	20	13.4	13.5	20.3	0.8	10	*	8.5	
24	16.9	4.3	52	*	6.5	18.8	2.8	43	13.9	7	19.9	1.6	30	*	7.5	
25	18.1	2.2	54	*	6.5	19.8	1	14	10.8	18	20.5	0.7	15	*	9	
26	20.3	0.8	20	*	6	20.6	0.7	15	11.1	7.5	20.6	0.7	12	*	8	
27	14.2	5.5	60	*	9	16.1	4	55	12.4	6.5	18.7	2.2	40	*	7.5	
28	5.2	11.8	70	*	6.5	3	14	60	14.5	7.5	2	13.9	62	*	8.5	
29	12	6.8	62	*	8.5	9.3	8.5	62	15.4	6.5	15.7	3.9	90	*	6.5	
30	21	0.6	28	*	18.5	19.2	0.7	10	11.3		18.9	0.7	10	*		
31	19.8	1.2	60	*	5.5	19.5	1.2	58	11.2	13	19.8	1.4	38	*	9	
32	17.4	2.3	200	*	20.5	2.5	14.5	230	12.7	16.5	0.5	17.5	700	*	16	
33	7	9.7	74	*	5.5	5	10.4	100	12.2	10	0	12.5	1800	*	17	HC smell
34	18.2	3.3	70	*	7	18.8	2.8	70	14.5	7	18.8	2.8	70	*	7.5	Strong HC odor

\* point has no probes

F.E Warren AFB Soil Gas Monitoring Data (6/28/93)

Monitoring Point	O2(%)	CO2(%)	Shallow (3.0') TPH(ppm)	Temp(C)	Vacuum("H2O)	O2(%)	CO2(%)	Middle (5.5') TPH(ppm)	Temp(C)	Vacuum("H2O)	O2(%)	CO2(%)	Deep (8.0') TPH(ppm)	Temp(C)	Vacuum("H2O)	Remarks
1	9	10.2	66	20.9		3	15	60	15.6		1.2	15	61	11		
2	15	6	71	20.1		12.3	7.6	73			11.5	8.1	72	11.7		
3	15.6	4.8	68	21.6		15.5	4.8	70	15.4		15	5	72	11.5		
4	13.5	6.5	54	20.7		12.8	6.7	68	13.1		12	6.6	62	16.4		
5	11.3	8	50	21.5		5	12.4	50	18.4		0.8	16.5	52	13.6		
6	17	4.5	73	20.7		16.8	4.7	74	13.5		16.6	4.5	76	17.5		
7	13.3	3.4	60	*		18.9	2.8	60	15.4		19.2	2.6	60	*		
8	17.4	4.3	65	*		18.5	3.3	62	16		19	3	59	*		
9	20	1.6	20	*		20	1	10	13.3		20	1	14	*		
10	15.5	5.9	70	*		16.1	4.9	68	14.4		17.5	3.7	65	*		
11	11.8	7.3	80	*	5.5	1.8	16	60	16.8		4	12.8	66	*		
12	18	3.5	75	*	6	17.8	3.6	76	17.9	6	18.5	3	74	*	7.5	*points has
13	14	7.2	70	*	6	16.1	5.2	70	16.6	7	19.5	2.2	50	*	6	no probes
14	18.8	3.5	65	*	7	19	3.2	64	13.7	6	19.3	2.8	60	*	6.5	
15	17	4	55	*	5	16.8	3.6	55	14.7	7	17	3	50	*	7.5	
16	17.8	3.5	60	*	5	18.5	2.8	60	13.5	6.5	19	2.3	55	*	7	
17	15.5	6	72	*	5.5	17.8	4	70	15.5	6.5	18	3.4	70	*	6.5	
18	14.3	7.3	72	*	9	15.8	5.4	75	17.3	7	18.5	3	66	*	6.5	
19	18.4	3.5	66	*	6.5	19.5	2.2	58	14.7	10	20	1.5	45	*	7.5	
20	20.5	1.7	30	*	5	21	0.8	15	12.1	8.5	21	0.6	0	*	7	
21	19.5	2	38	*	6	20	1.6	30	13.6	11	20.5	1	24	*	7	
22	17.2	3.5	40	*	5.5	19	1.5	25	12.9	6.5	19.8	0.9	20	*	6.5	
23	18.2	3.1	40	*	5	19.1	2	30	15.2	11	20	1	20	*	7	
24	16	4.8	46	*	6.5	18	3	38	14.5	7	19.2	1.7	30	*	7.5	
25	19	3	50	*	6	19.7	1.2	30	10.4	17	20.3	0.8	20	*	6.5	
26	20.4	1.2	30	*	5.5	20.8	0.8	20	11.6	7	20.8	0.8	15	*	7.5	
27	16	5	52	*	8	17	4	52	13.4	6.5	19.3	1.8	40	*	7.5	
28	3.5	14.5	46	*	7	2	15.5	40	15.5	7.5	4.5	9.5	50	*	7	
29	11	8.5	60	*	6	6.9	11	55	16.5	7	13	5.5	68	*	8.5	
30	19.3	1.5	32	*	18.5	18	1.5	30	12	18	18.5	1.2	30	*	8.5	
31	20	1.9	30	*	6	19.5	1.8	26	11.2	13	19.5	1.6	24	*		
32	3.5	7.7	60	*		1	12.8	48	14		20.5	0.7	water	*		
33	10.3	10	55	*		5.9	11.8	55	13.2		0.8	6.8	63	*		
34	17.5	3.9	62	*		17.2	3.8	64	16.2		16.3	4.2	66	*		



**FE Warren Initial Data Before the Blowers Shutdown (8/16/93)**

Monitoring Point	Shallow (3.0')			Middle (5.5')			Deep (8.0')			Remarks					
	O2(%)	CO2(%)	TPH(ppm)	Temp(C)	Vacuum("H2O)	O2(%)	CO2(%)	TPH(ppm)	Temp(C)		Vacuum("H2O)	O2(%)	CO2(%)	TPH(ppm)	Temp(C)
1	14	3.9	70			13.7	5.8	76			12.2	6.2	56		
2	17.6	3.3	84			11.5	7.3	80			1.5	7.8	78		
3	16	4	76			13	5.5	80			14	4.3	80		
4	21	0.3	70			14	3.9	64			14	3.8	68		
5	19.2	1.9	64			15.5	4	60			14.5	4.5	73		
6	16.5	4.2	88			18.5	2.2	87			17	3.5	94		
7	18.6	2.6	82			18.6	2.3	80			19	2	84		
8	19.8	2.8	130			18.3	2.8	120			19.5	1.8	130		
9	20.2	0.8	110			20.3	0.8	96			20.4	0.7	100		
10	16.3	4.4	86			16	4.7	86			17.6	2.7	84		
11	10.1	7.3	82			8.5	8.8	72			2.2	9.5	65		
12	17.3	3.4	74			18	2.8	74			18	2.6	73		
13	15.5	6.5	71			14	4.5	75			18.5	2.6	69		
14	18.2	3.2	70			18.5	2.9	71			18.9	2.4	95		
15	18.2	2.2	78			19	2.2	80			20	1.2	65		
16	18.8	2.3	73			19.5	1.4	66			20.2	0.8	50		
17	15	5.2	87			15.5	4.8	85			18.3	2	78		
18	13	7.2	96			14.5	5.6	100			17.8	2.9	98		
19	17	4	90			19	2.2	80			19.8	1	65		
20	20	1	60			19	0.8	46			20.5	0.5	30		
21	19.5	1.3	60			20.2	0.7	54			20.2	0.6	30		
22	16.3	3.8	78			19.6	1.8	60			20	0.8	30		
23	18	2.9	65			19.5	1.2	54			20.2	0.7	30		
24	16.5	4.2	82			17.5	3.3	77			19.5	1	51		
25	19.2	2	73			20.6	0.7	50			20.8	0.6	26		
26	20	0.9	120			20.5	0.7	40			20.5	0.7	26		
27	9.4	5	120			15.2	4.4	120			13.2	1.9	110		
28	6	9.8	80			6.5	10.5	70			7	7	74		
29	12.2	6.8	50			11	7	85			17	2	48		
30	20.4	0.8	50			20.5	0.5	43			19.7	0.9	56		
31	20.5	0.6	50			20	0.7	40			20	1.2	60		
32	21	0.3	90			4.5	13	190			3.2	14.5	4800		
33	9.5	9.5	72			7	10	67			20.5	0.5	20		
34	15.3	4.8	76			14.5	4.9	83			15.5	2.3	70		

FE Warren AFB Soil Gas Monitoring Data (9/20/93)

Monitoring Point	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Shallow (3.0') TPH(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Middle (5.5') TPH(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Deep (8.0') TPH(ppm)	Temp(C)	Vacuum("Hg)	Remarks
1	5.5	11.6	120	17.6	0.5	2.1	15	130	19	5.5	0.5	16	130	18.1	6	
2	11.7	7	100	17.6	5	8	10	110		6	5.5	12.5	120	18	7	
3	2.1	8.9	105	19.4	5.5	1.8	9.6	110	20.5	6	2.6	10	110	18.3	5.5	
4	10.2	2	110	19.8	5	0.8	12.3	120	19.5	9	0	14.5	120	20.9	7	Standing water
5	10.8	7.8	100	18	5	7.8	10	110	19.9	5.5	3.4	13	120	19.8	6	Standing water
6	12.5	6.3	100	18.7	5.5	12.6	6.3	100	19.6	9	11	7.6	110	20.4	6.5	
7	17.5	3.6	100	*	12.5	17.8	3.2	100	20	6.5	18	3	100	*	6	Standing water
8	16.6	4.5	110	*	6	12.5	3.8	100	21.1	6	18	3.5	100	*	6	Standing water
9	20	1.7	60	*	5	20.2	1.1	50	21.3	5.5	20.5	0.8	40	*	6	Standing water
10	15	6	120	*	5.5	16	5	110	21	6.5	18.2	2.8	100	*	7	
11	12	6.9	90	*	5	11.5	7.5	95	20.2	7	6.5	9.7	110	*	6.5	1. *: has no probe;
12	17.4	3.8	93	*	4.5	17.2	3.8	93	20.4	5.5	17.8	3.2	88	*	6.5	2. TPH values in italic
13	14.4	6.5	97	*	5	15.5	5.8	95	23	5.5	19.2	2.2	77	*	6	are readings used 1.
14	17.5	3.7	83	*	5.5	17.8	3.7	85	21.3	6	18.2	3.2	82	*	6	dilutor.
15	18.8	2.6	90	*	5.5	19	2.4	85	18	7.5	20	1.1	60	*	6	
16	18.8	2.4	85	*	5	19.6	1.6	70	18	6.5	20.3	0.8	50	*	7.5	Standing water
17	16.5	4.6	110	*	5	18.1	3	100	19.8	5.5	18.8	2	80	*	6.5	Standing water
18	10	9.4	100	*	7.5	11.3	8.1	100	24	6	15	5	110	*	6.5	
19	17	4	100	*	5	19.2	2.8	80	22.1	5.5	19.8	1.2	60	*	6.5	
20	20.3	0.9	50	*	4.5	20.5	0.7	40	18.2	7.5	21	0.6	16	*	6	
21	19.6	1.2	40	*	5	19.9	0.8	40	17.9	9	20.6	0.6	10	*	6	Standing water
22	17	3.3	110	*	5	19.3	1.3	85	18.1	6.5	20.2	0.7	50	*	7.5	
23	19.1	1.9	80	*	5	20.2	0.9	60	18.2	11.5	20.6	0.6	40	*	7	
24	17	3.8	100	*	5.5	18	3.2	100	18.5	7	19.4	1.8	80	*	6.5	
25	19.2	2.1	70	*	6	20	1	40	16.6	17.5	21	0.6	10	*	7.5	
26	20	0.9	52	*	5	20.5	0.7	35	16.7	6.5	20.5	0.6	24	*	6	
27	8.8	8	100	*	7	11.5	6.2	90	18.9	7.5	15.5	3.4	100	*	7	
28	4.4	10.5	100	*	5.5	2.5	12	100	20.4	6	3.2	9.7	100	*	6	
29	13.8	5.5	100	*	5.5	11.5	6.8	100	20.4	6	18.7	1.7	80	*	7	Standing water
30	19.8	0.9	60	*	5	19.8	1.2	60	16.3	17.5	19.7	1.3	61	*	6.5	
31	20.5	0.6	160	*	5	19.5	0.8	140	16.2	17	19	1.5	140	*	9.5	
32	15.5	4.5	190	*	19.5	3.2	14.5	190	17.7	17.5	0	17.5	2900	*	7.5	HC smell deep
33	10.8	8.2	710	*	5.5	8	9.4	140	16.5	10.5	0	14	1000	*	11	HC smell deep
34	17	3.8	130	*	6	16.5	4.2	140	19.6	6.5	17.2	3	130	*	6.5	

FE Warren AFB Soil Gas Monitoring Data (10/16/93)

Monitoring Point	O2(%)	CO2(%)	Shallow (3.0') TPI(ppm)	Temp(C)	Vacuum("Hg)	O2(%)	CO2(%)	Middle (5.5') TPI(ppm)	Temp(C)	Vacuum("Hg)	O2(%)	CO2(%)	Deep (8.0') TPI(ppm)	Temp(C)	Vacuum("Hg)	Remarks
1	13.9	6.3	110	13.3	4.5	11.6	8	120	15	3.5	10.5	8.8	110	15	4.5	
2	18.2	3.2	115	13.9	2.5	17.8	3.6	115	n/a	3.5	16.8	4.5	120	15.6	3.5	
3	19	2	130	15.3	4	19	2.3	140	17	4	18	3	140	15.8	4.5	shallow no flow
4	19	2.2	110	15.3	4	18.6	2.6	120	16.8	5.5	19.1	1.8	120	17.4	5	
5	-	-	-	13	21	11.5	7.3	120	15	5	10	7.9	110	15.8	5.5	1. *. has no probe;
6	19	2.2	115	14.1	3	18.8	2.3	120	16.3	7	18.3	2.8	120	15.7	4	2. TPI values in italic;
7	20.1	1	100	*	10	20.2	1	100	14.9	3.5	20.2	1	100	*	3.5	are readings used 1:
8	19.2	2.2	80	*	3.5	19.5	2	80	16.2	4.5	19.5	1.8	80	*	5.5	dilutor.
9	20.5	0.7	50	*	2.5	20.8	0.6	40	17.2	3	20.9	0.6	35	*	4	
10	17.7	3.6	120	*	4	18	3.3	110	17.9	3.5	18.2	2.8	110	*	5	
11	16.4	3.9	120	*	3.5	16	4.3	120	16.2	5	12.5	6.2	120	*	4.5	
12	19.3	1.8	80	*	3.5	19.5	1.8	84	15.6	5	19.8	1.3	82	*	4.5	
13	18.5	3.1	90	*	3.5	18.8	2.8	90	18.9	4.5	20	1	60	*	5	
14	19.2	2	100	*	3.5	19.3	2	100	17.9	4	19.8	1.6	100	*	4.5	
15	20.2	1.1	74	*	3	20.2	1	73	13.5	3.5	20.8	0.7	53	*	4	
16	20.7	0.7	48	*	5	20.3	0.9	64	14.4	4	20.6	0.7	46	*	5	
17	18.9	2.7	110	*	3.5	19.5	1.7	92	16.2	5	19.2	1	76	*	5	
18	17	4	120	*	6.5	17.5	3.8	120	19.5	5	18.9	2.3	110	*	4.5	
19	18.2	3.3	100	*	3.5	19	2.6	90	18.1	3.5	19.8	1.5	70	*	4	
20	20.9	0.6	34	*	3.5	20.9	0.6	30	13.9	6.5	20.9	0.6	10	*	5	
21	20.4	0.8	48	*	3	20.4	0.7	40	13.6	6	20.8	0.6	10	*	5	
22	19.6	1.5	100	*	3.5	20.2	0.8	60	14.6	4	20.7	0.6	40	*	4.5	
23	20.2	1	80	*	4	20.5	0.8	60	14	9	20.8	0.6	40	*	5	
24	20.1	1	80	*	4	19.6	1.8	100	14.5	3.5	20.2	1	80	*	4	
25	19.6	1.8	74	*	5	20.2	0.9	50	16.5	13	20.8	0.7	20	*	6	
26	20.2	1	41	*	3.5	20.6	0.7	26	13.7	5	20.8	0.7	20	*	5	
27	14	6	110	*	5	15.4	4.8	100	15.7	4.5	18.7	2.2	80	*	5	
28	12	6.4	120	*	4.5	10.5	7.4	110	17.2	5.5	12.7	5.1	110	*	6	
29	18.5	2.8	120	*	4.5	17.2	3.5	130	17.8	5	19	1	90	*	5	
30	20.3	1	47	*	3.5	20	1.1	50	12.6	16	20	1.5	55	*	5	
31	20.8	0.8	30	*	3	20	0.8	30	12.8	14.5	20	1.7	45	*	66	
32	11.6	7.2	120	*	18	4.2	13.6	100	15.1	14.5	0	17	600	*	4.5	HC snell deep
33	12.1	7.3	130	*	4	9	9	140	14.4	7.5	0	14	1000	*	8	HC snell deep
34	18.2	3.3	100	*	5	17.5	3.7	110	9.6	5	17.8	3.1	100	*	5.5	Start pt. @8:30am

Monitoring Point		Shallow (3.0')			Middle (5.5')			Deep (8.0')			Remarks				
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH(ppm)	Temp(C)	Vacuum("Hg)
1	13.5	5.5	130	0.5	10	10	8	130	3.3	10	9.5	8	130	6.6	13
2	10.5	4	110	0.9	11	7	4.9	120	*	12	6.5	5.5	120	6.5	12
3	2.8	4.2	110	1.5	12	1.5	4.7	120	3.6	13	6.5	3.5	110	7.5	12
4	8	7.5	120	2.4	9	5.6	9.2	130	8.3	12	5	10	130	5.4	15
5	15.3	4.9	120	0.5	11	15	4.7	120	3	11	12.3	6.5	125	8	12
6	16.5	3.3	110	0.6	10	17.5	2.7	110	7	12	17	3.3	120	3.1	11
7	19	2	100	*	16	19	2	96	4.9	10	19.5	1.7	90	*	20
8	19	2.4	100	*	8	19	2.4	100	5.4	8	19.3	2.2	98	*	10
9	20.5	0.7	60	*	8	20.5	0.6	50	7.4	11	20.5	0.7	56	*	11
10	18.5	2.7	105	*	12	19	2.2	100	8.3	13	no flow	no flow	no flow	*	20
11	17.8	2.8	100	*	10	17.3	3.3	110	5.5	12	13.9	4.8	120	*	12
12	19.8	1.1	74	*	10	20	1	74	3.6	11	20	0.9	60	*	13
13	19.7	1.4	83	*	10	19.7	1.4	82	7.2	10	20.3	0.7	60	*	10
14	19.2	2.2	91	*	9	19.3	2	90	8.1	10	19.8	1.2	78	*	10
15	20.2	1	64	*	11	20.5	1	74	5.2	13	20.5	0.7	60	*	12
16	20	0.9	68	*	8	20.5	0.8	58	6.7	9	20.5	0.8	58	*	10
17	19.6	1.5	70	*	9	20.2	0.8	50	6.5	11	20.5	0.7	40	*	10
18	18.2	3.1	110	*	10	18.3	3	120	8.1	10	19	2	96	*	14
19	19.8	1.3	78	*	9	20	0.9	74	8.9	10	20.2	0.8	60	*	11
20	20	0.8	60	*	8	19.7	0.9	52	6	11	20	0.8	62	*	10
21	19.6	0.9	57	*	15	20	0.7	48	4.1	11	20.6	0.6	30	*	14
22	19.5	1.5	74	*	9	20	0.9	60	5	10	20.2	0.7	46	*	12
23	20	0.9	54	*	12	20.5	0.6	33	3.9	16	20.8	0.6	15	*	9
24	20	1	60	*	9	20	0.9	53	5.2	10	20.5	0.6	36	*	11
25	16.8	1.6	58	*	12	16.5	0.8	30	5.6	12	16.2	0.7	42	*	10
26	12.5	3.7	120	*	8	13	4.8	120	5.6	10	13.5	4.2	120	*	11
27	11.1	6.5	130	*	10	13.5	4.8	130	5.4	12	15	3.9	120	*	12
28	7.7	7.8	130	*	12	7.8	8	130	7.6	15	10.5	6.5	130	*	20
29	19.4	1.6	90	*	9	18.2	2.3	97	6.2	13	20	0.8	56	*	12
30	20	0.9	56	*	10	20	0.8	42	4.3	18	20	0.8	47	*	12
31	20.5	0.7	20	*	12	20.5	0.7	32	5.4	16	19.5	1.2	78	*	11
32	13.2	5.2	110	*	23	9.5	6.5	110	6.8	20	2.3	12.5	2000	*	14

FE Warren AFB Soil Gas Monitoring Data (1/15/94)

Monitoring Point	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Shallow (3.0')	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Middle (5.5')	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Deep (8.0')	Temp(C)	Vacuum("Hg)	Remarks
1	19.7	1.3	93	2.3	5.0	19.5	1.4	97	4.9	3	19.1	1.7	110	8.2	5	
2	20.0	0.8	65	3.7	2.0	19.7	0.9	73	*	2	19.5	1.0	82	8.8	2	
3	18.5	0.8	60	2.6	1.5	18.2	0.8	70	6.3	2	18.8	0.8	60	8.4	2	
4	18.2	1.5	105	3.3	1.5	19.0	1.3	95	8.9	2	18.0	2.5	130	6.0	2	
5	20.2	0.9	70	2.1	2.0	20.5	0.8	63	4.3	2	19.7	1.3	90	9.0	1	1. *: has no probe;
6	20.3	0.7	53	2.2	2.0	20.3	0.7	48	8.6	2	20.0	0.8	73	4.4	2	2. TPH values in italic are readings used 1:1
7	20.8	0.5	30	*	1.0	20.8	0.6	42	6.2	1.5	20.8	0.6	30	*	1	dilutor.
8	20.6	0.7	56	*	1.0	20.8	0.7	47	6.6	1	20.8	0.6	46	*	1.5	
9	21.0	0.5	36	*	1.0	21.0	0.5	27	7.8	1	21.0	0.5	24	*	1	
10	19.3	2.2	120	*	6.0	19.6	1.9	120	9.0	6.5	20.5	0.8	70	*	12	
11	18.9	1.3	120	*	6.0	19.0	2.3	120	6.7	6.5	15.5	3.6	140	*	6.5	
12	20.5	0.8	60	*	6.0	20.5	0.8	66	4.0	6	20.5	0.8	67	*	7	
13	20.3	1.0	80	*	6.0	20.5	1.0	80	7.0	7	20.8	0.7	56	*	7.5	
14	20.0	1.4	90	*	7.5	20.0	1.4	97	8.1	8	20.2	0.9	80	*	8	
15	19.8	1.2	100	*	7.0	19.7	1.3	90	5.2	8	20.2	1.2	90	*	8	
16	20.0	1.0	80	*	7.0	20.2	0.8	70	7.0	11	21.0	0.5	22	*	9	
17	19.3	2.1	110	*	6.0	19.5	1.9	120	6.7	8	20.0	1.4	100	*	8	
18	19.8	1.7	110	*	9.0	20.0	0.9	30	7.7	8	20.4	0.9	80	*	7.5	
19	20.5	0.9	75	*	7.0	20.5	0.8	63	9.2	7.5	20.8	0.7	57	*	8	
20	20.9	0.7	73	*	6.5	21.0	0.6	20	5.8	9	21.0	0.8	24	*	7.5	
21	20.7	0.7	52	*	7.0	21.0	0.6	40	4.5	10	21.0	0.5	26	*	10.5	
22	19.5	1.5	85	*	6.0	20.5	0.7	45	6.2	8	21.0	0.6	15	*	9	
23	20.3	0.8	70	*	8.0	20.2	0.8	90	4.8	11	20.5	0.8	60	*	9	
24	19.5	1.9	110	*	8.0	19.8	1.7	100	6.0	8.5	20.4	1.3	90	*	9	
25	20.5	1.1	74	*	10.5	20.9	0.8	50	6.7	17	21.0	0.6	30	*	11	
26	no flow	no flow	no flow	*	19.0	20.8	0.7	6	6.8	10	21.0	0.6	5	*	9.5	
27	19.5	2.5	120	*	9.0	19.8	2.3	110	6.4	9	20.8	0.8	60	*	9	
28	11.5	6.4	150	*	8.0	15.4	4.3	150	8.4	9.5	14.5	4.3	160	*	10	
29	16.7	3.8	140	*	10.0	14.2	5.3	150	6.2	9.5	19.0	2.0	100	*	11	
30	20.5	0.7	34	*	8.0	20.5	0.9	60	4.4	16	20.5	0.9	60	*	9.5	
31	21.0	0.8	58	*	13.0	20.8	0.8	52	5.0	15.5	20.8	1.0	67	*	10.5	Amb. temp.=30.0 C @ 9:00 am
32	19.2	1.3	80	*	22.0	6.2	10.0	150	6.6	19	1.5	12.5	1800	*	12	HC smell @deep
33	17.5	3.5	120	*	12.0	14.5	4.8	140	8.7	15	3.0	10.8	780	*	15	HC smell @deep
34	20.0	1.2	72	*	13.0	20.0	1.3	80	10.3	13	19.5	1.5	85	*	12	Started point @ 8:30am

FE Warren AFB Soil Gas Monitoring Data (2/12/94)

Monitoring Point	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Shallow (3.0') TPH (ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Middle (5.5') TPH (ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Deep (8.0') TPH (ppm)	Temp(C)	Vacuum("Hg)	Remarks
1	12.5	6.8	170	-0.6	9.0	12.6	6.7	190	2.3	9	13.2	6.5	170	5.7	10	
2	15.0	2.6	130	-0.8	8.0	10.5	4.0	170	*	9	9.2	4.6	150	4.4	10	
3	5.0	2.6	110	-0.7	9.0	1.9	3.2	130	2.8	10	0.5	3.7	170	5.0	11	
4	11.5	5.0	160	0.1	9.0	8.6	6.8	180	5.2	16	3.2	11.0	175	2.7	15	
5	16.5	2.8	150	-1.7	8.0	16.4	3.9	160	0.5	9	14.2	5.0	170	4.9	9.5	1. *: has no probe;
6	16.5	3.3	160	-1.6	9.0	16.5	3.3	140	4.6	11	16.2	3.7	150	0.8	11.5	2. TPH values in italic
7	no flow	no flow	no flow	*	15.0	20.2	1.3	94	2.5	9	19.7	1.6	120	*	9	are readings used 1:1
8	19.7	1.8	100	*	8.0	20.0	1.5	100	2.2	10	19.7	1.7	100	*	10	dilutor.
9	20.6	0.8	66	*	8.0	19.5	0.7	50	3.4	12	20.9	0.6	44	*	11	
10	19.2	2.3	130	*	9.0	17.8	1.8	130	5.1	12	no flow	no flow	no flow	*	20	
11	18.4	2.5	135	*	8.0	20.2	0.9	80	0.6	9	12.6	4.3	160	*	11	
12	20.5	0.8	58	*	8.0	20.3	1.2	90	3.4	11	20.4	0.8	78	*	10	
13	20.0	1.2	100	*	9.0	20.2	1.5	90	3.7	10	20.6	0.7	50	*	9	
14	19.8	1.8	90	*	9.0	20.2	1.5	90	3.7	10	20.5	1.0	60	*	10	
15	20.5	0.8	78	*	9.0	20.6	0.8	74	2.5	10	no flow	no flow	no flow	*	20	
16	20.5	0.8	70	*	8.0	20.8	0.6	44	4.1	9	20.9	0.5	38	*	10	
17	20.2	1.2	100	*	9.0	20.5	0.8	80	3.9	9.5	20.9	0.6	58	*	10	
18	18.8	2.7	140	*	10.0	18.0	2.4	140	4.6	9.5	19.5	1.6	120	*	10	
19	20.3	1.0	95	*	8.0	20.5	0.8	78	4.9	9	20.8	0.7	44	*	9.5	
20	20.6	0.7	46	*	8.0	20.8	0.6	44	4.0	10	20.9	0.5	34	*	9	
21	20.7	0.7	60	*	9.0	20.5	0.7	49	3.8	11	21.0	0.5	24	*	10	
22	20.4	0.8	70	*	8.0	20.8	0.7	32	6.7	9	21.0	0.5	26	*	11	
23	20.8	0.7	46	*	8.0	21.0	0.6	40	6.6	13	21.0	0.5	27	*	10	
24	20.3	1.0	90	*	8.0	20.2	1.0	94	5.8	9.5	20.8	0.7	60	*	9	
25	20.3	1.1	91	*	9.0	20.8	0.7	52	4.4	16	21.0	0.5	38	*	10	
26	no flow	no flow	no flow	*	19.0	21.0	0.5	52	4.6	10	21.0	0.5	36	*	10	
27	19.5	1.6	120	*	10.0	20.0	1.4	100	4.3	9	20.9	0.9	84	*	10	
28	16.2	3.8	150	*	8.0	14.7	4.7	160	6.7	9	no flow	no flow	no flow	*	20	
29	no flow	no flow	no flow	*	20.0	18.9	2.0	120	4.7	9	8.0	19.8	80	*	10	
30	20.5	1.0	84	*	9.0	20.5	1.0	46	3.7	17	20.5	1.0	74	*	10	
31	18.9	0.7	62	*	8.0	20.7	0.8	66	7.2	16	20.5	0.9	83	*	11	
32	no flow	no flow	no flow	*	20.0	6.2	10.2	170	5.0	17	0.0	15.5	2,100	*	12	HC smell @ depth
33	17.5	2.7	80	*	8.5	14.0	4.8	200	5.4	11	0.0	15.0	1,000	*	11	HC smell @ depth
34	no flow	no flow	no flow	*	20.0	20.0	0.9	90	6.3	9	19.5	1.2	100	*	9	

FE Warren AFB Soil Gas Monitoring Data (3/26/94)

Monitoring Point	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Shallow (3.0y) TPH(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Middle (5.5y) TPH(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Deep (8.0y) TPH(ppm)	Temp(C)	Vacuum("Hg)	Remarks
1	16.7	4.2	120	4.4	8.5	15.0	5.3	120	4.0	9	14.0	5.7	120	4.2	9.5	
2	19.0	2.5	94	4.5	8.0	18.5	3.0	96	*	9	17.8	3.3	100	5.0	9	
3	19.8	1.2	67	4	12.0	19.8	1.5	72	4.8	12.5	19.4	1.9	82	4.9	13	
4	19.5	1.5	72	6.1	8.0	19.7	1.8	77	7.6	14	19.5	1.5	74	6.6	14	
5	16.0	4.2	120	4.6	8.0	12.8	6.8	125	5.6	9	10.3	7.2	120	6.4	9.5	1. *: has no probe;
6	20.0	1.5	75	5.1	8.0	19.5	1.5	78	6.4	10.5	19.5	1.8	81	5.5	9	2. TPH values in italic
7	20.2	0.9	57	*	14.0	20.5	0.7	48	4.9	9	20.5	0.8	48	*	9.5	are readings used 1:1
8	20.0	1.5	73	*	11.0	20.0	1.4	70	4.8	9	19.9	1.3	67	*	9	dilutor.
9	21.0	0.5	30	*	10.0	21.0	0.4	25	4.1	8.5	21.0	0.4	22	*	9	
10	19.0	2.3	89	*	12.0	19.5	1.8	80	6.0	13	20.0	1.2	67	*	10.5	
11	18.2	2.8	100	*	8.0	18.0	3.2	110	6.7	9.5	16.0	4.5	120	*	9	
12	20.2	1.1	72	*	8.0	20.2	1.2	73	5.3	9	20.1	0.9	66	*	10	
13	20.0	1.7	90	*	8.5	20.0	1.4	83	5.2	9	21.0	0.7	50	*	9.5	
14	20.3	1.5	82	*	8.5	20.7	1.3	81	4.8	9	20.5	1.0	69	*	9.5	
15	20.5	0.9	62	*	10.5	20.6	0.8	57	6.3	13	20.9	0.5	38	*	13	
16	20.7	0.8	49	*	8.0	20.9	0.6	39	6.3	9	21.0	0.4	26	*	9	
17	20.2	1.3	70	*	9.0	20.8	0.7	44	7.0	9	21.0	0.4	27	*	9	
18	19.3	2.3	93	*	14.0	19.7	2.0	80	6.8	13	20.0	1.1	60	*	13	
19	20.2	1.2	54	*	8.0	20.6	0.8	40	6.2	9	21.0	0.4	28	*	9.5	
20	20.0	0.8	58	*	8.0	19.9	0.8	48	4.8	10	20.2	0.7	43	*	9	
21	20.3	0.5	40	*	8.0	20.8	0.4	33	4.4	11	20.8	0.3	12	*	10	
22	20.0	0.8	63	*	8.0	20.4	0.5	38	NR	9	20.5	0.3	28	*	10	
23	20.8	0.6	47	*	8.0	21.0	0.4	32	5.4	12.5	21.0	0.3	16	*	12.5	
24	19.8	1.5	66	*	11.0	20.2	1.2	78	7.1	14	20.5	0.8	63	*	12.5	
25	20.0	1.3	75	*	8.0	20.3	0.7	46	5.4	17.5	20.6	0.6	36	*	9.5	
26	20.2	0.8	53	*	9.0	21.0	0.3	18	4.9	9.5	21.0	0.3	6	*	9.5	
27	16.0	4.0	120	*	10.5	17.2	3.0	100	4.8	10	19.0	1.6	80	*	10	
28	14.0	5.0	120	*	8.0	14.0	5.1	120	7.5	9	16.0	3.8	110	*	9.5	
29	19.2	1.6	67	*	8.5	19.0	2.0	74	7.2	12.5	20.7	0.5	23	*	13.5	
30	20.2	1.0	60	*	8.5	20.2	1.0	58	3.9	17.5	20.5	1.0	57	*	10	
31	20.3	0.7	44	*	8.5	20.3	0.8	40	5.0	16	20.4	0.8	40	*	11	
32	no flow	no flow	no flow	*	19.0	6.0	10.8	300	6.2	16	0.0	14.3	1,600	*	10	HC smell @depth
33	15.6	4.5	140	*	8.5	12.3	6.3	150	6.2	11	0.0	14.0	760	*	11	HC smell @depth
34	20.2	1.2	65	*	9.0	20.0	1.3	74	7.3	9.5	20.0	1.3	80	*	9.5	

## TFE Warren AFB Soil Gas Monitoring Data (4/23/94)

Monitoring Point		Shallow (3.0')			Middle (5.5')			Deep (8.0')			Remarks					
O2(%)	CO2(%)	TPH(ppm)	Temp(C)	Vacuum("Hg)	O2(%)	CO2(%)	TPH(ppm)	Temp(C)	Vacuum("Hg)	O2(%)		CO2(%)	TPH(ppm)	Temp(C)	Vacuum("Hg)	
1	13.0	5.2	100	11.1	8.0	10.0	6.5	100	6.2	9	8.2	7.0	4.3	9	1. *: has no probe; 2. TPH values in italic are readings used 1:1 dilutor.	
2	16.0	3.0	92	10.3	7.5	14.0	4.0	100	*	8	12.5	4.4	100	5.7		12.5
3	6.0	3.7	80	9.8	8.5	5.7	3.8	80	5.4	12	5.4	3.7	80	6.1		10
4	7.8	7.0	87	11	10.0	5.0	9.0	91	8.2	13.5	2.8	11.0	90	7.6		13
5	17.0	3.5	80	11.6	8.0	15.0	4.5	90	8.4	8	11.1	6.5	90	7.3		9
6	17.5	2.9	79	10.3	8.0	18.0	2.3	73	6.8	14	18.0	2.2	70	7.6		9
7	19.0	1.7	65	*	14.0	19.2	1.4	58	6.6	8.5	19.2	1.3	53	*		9
8	18.9	2.2	78	*	8.0	19.2	1.7	70	7.3	8.5	19.3	1.5	64	*		9
9	20.3	0.7	40	*	12.5	20.5	0.5	32	5.3	8.5	20.5	0.4	26	*		9
10	19.0	2.3	76	*	8.0	19.4	1.7	68	6.0	8.5	19.8	0.9	48	*		14
11	18.2	2.3	77	*	7.5	17.2	3.2	85	8.4	9	15.3	4.6	95	*	9	
12	20.2	0.8	40	*	7.5	19.8	1.2	50	7.2	8	19.8	0.8	53	*	9	
13	19.2	1.9	86	*	10.0	19.7	1.3	80	6.2	9	20.5	0.5	60	*	9	
14	19.5	1.6	82	*	12.0	19.7	1.3	77	5.5	12.5	20.0	1.0	65	*	13	
15	19.8	1.2	58	*	7.5	19.9	1.0	48	7.5	10	20.5	0.5	34	*	8.5	
16	20.0	0.8	48	*	7.5	20.3	0.6	42	7.1	11	20.3	0.4	36	*	9	
17	19.3	1.7	74	*	7.7	20.0	0.9	44	8.1	12	20.4	0.4	30	*	12.5	
18	18.2	2.9	84	*	9.5	18.6	2.3	76	6.8	9	19.5	1.3	58	*	9	
19	20.0	1.1	40	*	7.5	20.4	0.7	35	7.1	9	20.5	0.5	32	*	9	
20	20.0	1.2	62	*	11.5	20.0	0.8	54	5.4	13.5	20.0	0.7	50	*	13	
21	20.3	0.7	37	*	10.0	20.5	0.5	30	6.1	14	20.9	0.2	19	*	12.5	
22	20.0	1.0	58	*	8.0	20.5	0.5	34	not reading	9	20.8	0.3	10	*	10	
23	20.2	0.8	44	*	8.0	20.5	0.5	26	7.4	12.5	20.8	0.2	18	*	9.5	
24	19.0	2.0	83	*	11.0	19.7	1.3	70	7.9	10	20.2	0.8	45	*	9	
25	19.8	1.8	60	*	12.0	20.0	1.0	40	5.0	17	20.2	0.8	38	*	13	
26	20.0	1.4	50	*	8.5	20.6	0.6	20	5.5	13	20.9	0.4	17	*	13	
27	14.5	5.0	94	*	10.0	16.0	3.9	84	6.1	9.5	18.0	2.4	65	*	10	
28	12.0	6.8	95	*	8.0	12.2	6.5	93	8.2	9	14.5	4.7	90	*	9	
29	18.3	2.5	80	*	7.5	18.0	2.8	82	7.9	9	20.0	0.9	40	*	13	
30	20.5	0.6	60	*	8.5	20.4	0.7	60	4.7	17	20.3	0.6	54	*	10	
31	20.4	0.7	100	*	8.0	20.5	0.5	30	5.5	15.5	20.5	0.5	40	*	10.5	
32	no flow	no flow	no flow	*	19.0	15.5	4.2	130	7.3	17	14.0	5.0	2,000	*	11	
33	14.7	5.2	120	*	8.5	11.3	7.0	130	6.7	10.5	0.0	13.8	1,000	*	15.3	
34	19.8	1.6	70	*	9.0	19.7	1.6	74	7.5	9	19.8	1.4	74	*	9	



F.E. Warren AFB Soil Gas Monitoring Data (8/3/94)

Monitoring Point	Shallow (3.0')			Middle (5.5')			Deep (8.0')			Remarks
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH(ppm)	Temp(°C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH(ppm)	Temp(°C)	Vacuum("Hg)
1	11.9	6.9	71	18.8	8.0	10.3	6.1	74	•	12.0
2	14.0	4.8	72	18.0	8.0	10.5	7.0	77	•	9.0
3	1.8	8.0	80	18.6	8.5	1.8	8.0	80	13.3	8.5
4	5.5	11.5	70	18.4	8.0	4.2	13.2	80	12.1	12.0
5	15.0	4.5	66	19.0	8.5	11.5	6.8	67	16.6	8.5
6	17.0	3.0	64	18.7	8.0	17.0	3.0	60	11.6	10.5
7	17.3	3.2	60	•	14.5	17.8	2.8	56	13.4	9.0
8	16.0	4.4	69	•	8.0	16.5	4.0	70	14.0	9.0
9	19.0	1.5	48	•	8.0	19.3	1.2	42	11.1	8.5
10	17.8	3.2	42	•	8.0	18.5	2.4	55	12.3	8.5
11	16.1	3.8	62	•	8.0	14.5	4.8	65	15.1	13.0
12	19.2	1.5	46	•	11.0	19.0	1.8	47	16.7	12.5
13	16.9	3.7	69	•	13.0	17.5	3.2	63	13.7	11.5
14	18.5	2.5	58	•	8.5	19.3	1.7	49	14.4	11.0
15	19.0	1.9	53	•	8.0	20.0	1.0	36	13.4	13.0
16	19.4	1.4	46	•	8.0	20.0	0.8	35	12.5	9.0
17	18.0	2.8	67	•	8.0	19.2	1.5	50	14.3	11.5
18	16.5	4.0	74	•	10.0	17.2	3.3	69	16.6	9.0
19	19.5	1.5	47	•	8.0	18.4	2.3	58	11.0	9.0
20	20.0	1.0	40	•	7.5	19.8	1.3	44	11.0	10.0
21	20.2	0.9	34	•	8.0	20.5	0.8	28	12.4	11.5
22	19.8	1.5	35	•	8.0	20.5	0.8	21	NR	9.5
23	20.0	1.3	44	•	11.0	20.7	0.7	30	14.3	12.5
24	18.3	3.1	65	•	8.0	19.5	1.8	55	13.9	8.5
25	19.5	2.2	47	•	9.0	19.8	1.2	35	10.0	17.0
26	19.5	1.8	47	•	8.0	20.6	0.6	19	10.5	9.5
27	11.9	7.5	74	•	9.5	13.2	5.4	71	12.1	9.0
28	12.0	6.5	70	•	8.0	10.0	9.0	78	14.2	8.5
29	17.0	3.6	72	•	8.0	16.2	4.1	74	14.7	9.0
30	20.5	1.2	30	•	8.0	20.0	1.3	40	11.1	17.0
31	20.8	0.7	20	•	8.0	20.4	0.7	22	10.8	15.5
32	no flow	no flow	no flow	•	21.0	5.3	12.5	140	13.2	16.0
33	13.5	7.0	87	•	8.5	10.5	8.8	90	12.3	11.5
34	19.2	2.5	64	•	9.0	19.4	2.1	58	14.5	9.0

F.E. Warren AFB Soil Gas Monitoring Data (8/25 26/94)

Monitoring Point	O2(%)	CO2(%)	Shallow (3.0') TPH(ppm)	Temp(C)	Vacuum(Hg)	O2(%)	CO2(%)	Middle (5.5') TPH(ppm)	Temp(C)	Vacuum(Hg)	O2(%)	CO2(%)	Deep (8.0') TPH(ppm)	Temp(C)	Vacuum(Hg)	Remarks
1*	14.2	6.9	170	23.3	5.5	8.0	11.0	120	20.3	1.5	6.4	11.7	120	15.6	1.5	
2*	16.0	3.5	140	22.4	5.5	15.5	3.7	140	*	1.5	14.5	4.5	150	15.5	1.5	
3*	16.2	2.6	120	24.7	5.0	16.0	3.0	130	20.1	2	16.0	2.8	not reading	4		
4*	15.5	3.1	130	23.9	5.5	15.5	3.2	130	17.6	2	17.0	1.7	100	20.8	5.5	
5	13.2	5.9	210	24.5	5.5	7.2	9.2	220	23.1	5.5	7.0	9.8	220	24.1	5.5	1. *: has no probe;
6	16.3	6.5	220	23.6	5.5	16.5	6.5	210	17.4	6	15.9	7.3	220	22.0	5.5	2. TPH values in italic
7*	13.5	6.5	160	*	4.0	12.0	7.8	150	19.7	1.5	11.2	8.0	160	*	1.5	are readings used 1:1
8*	12.7	8.0	180	*	5.5	9.7	10.7	160	21.2	5.5	8.0	13.0	165	*	1.5	dilutor.
9*	14.0	4.9	190	*	1.5	12.5	5.6	180	19.1	1.5	11.5	6.2	185	*	1.5	3. *: indicating monitored on
10	10.5	12.0	200	*	1.5	11.3	12.0	200	20.2	2	12.2	10.5	200	*	2	8/26, others on 8/25
11	9.5	12.9	210	*	5.5	7.0	16.0	220	21.5	2	0.0	21.0	210	*	2	
12*	14.7	9.5	200	*	5.5	10.5	18.3	205	21.4	5.5	10.0	25.0	210	*	5.5	
13	10.8	>25	180	*	2.0	11.8	>25	165	23.9	2	23.6	>25	140	*	2	
14	18.8	7.8	180	*	2.0	19.0	10.5	180	20.2	2	23.0	11.5	180	*	2	
15	16.5	6.0	140	*	2.0	15.5	6.8	140	18.8	3	15.0	6.9	140	*	2	
16	17.5	5.0	140	*	5.5	17.0	6.0	140	17.9	2	18.0	5.5	140	*	6	
17*	10.0	11.8	195	*	1.5	9.0	12.5	200	20.8	1.5	8.7	12.3	195	*	2	
18	4.3	24.0	170	*	2.0	2.3	>25	160	24.3	3	3.2	>25	150	*	5.5	
19	11.3	23.0	170	*	5.0	11.8	>25	150	22.3	3	14.7	>25	170	*	2	
20	19.5	1.2	120	*	2.0	20.2	0.8	93	16.7	6	20.7	0.5	38	*	5.5	
21	19.5	1.9	135	*	5.5	19.6	1.6	125	18.1	6.5	20.5	0.7	56	*	5.5	
22	18.0	3.1	160	*	5.0	19.1	1.6	125	not reading	2	19.8	0.9	90	*	5	
23	18.6	2.6	170	*	1.5	19.1	1.5	135	20.0	3	20.0	0.8	95	*	6	
24	14.2	6.5	185	*	5.5	16.3	4.4	180	18.9	5.5	18.0	2.8	16	*	5.5	amb. temp. 20.3 C @ 9.00
25	19.1	2.5	170	*	5.5	19.8	1.3	130	15.5	14	20.4	0.6	61	*	5.5	amb. temp. 22.3 C @ 10.30
26	19.6	0.9	145	*	1.5	20.0	0.7	120	15.9	1.5	20.2	0.6	100	*	1.5	
27	6.0	9.4	215	*	6.0	8.3	10.3	260	19.5	5.5	12.5	6.2	255	*	5.5	
28	10.9	12.0	220	*	5.5	10.8	8.5	205	22.2	6	18.2	2.7	180	*	2	
29	20.4	9.4	195	*	6.0	9.9	9.1	195	21.0	2	8.9	9.3	100	*	2	
30	20.4	0.6	84	*	2.0	20.3	0.8	140	15.3	2	20.0	1.2	165	*	2	
31	20.4	0.7	110	*	5.0	20.1	0.8	105	15.6	7	20.0	0.9	115	*	6	
32	no flow	no flow	no flow	*	19.0	4.9	15.0	240	18.9	8	0.0	20.0	4.900	*	2	HC smell @ depth
33	12.7	7.8	185	*	5.5	5.9	13.3	190	18.5	6	0.0	16.7	1.250	*	5	HC smell @ depth
34	16.7	4.2	180	*	2.0	17.0	3.9	180	22.4	2	18.8	6.7	130	*	2	

Table 1. FE Warren Soil Gas Data (9/23/94)

Monitoring		Shallow (3.0')			Middle (5.5')			Deep (8.0')			Remarks				
Point	O2(%)	CO2(%)	TPH(ppm)	Temp(C)	Vacuum("Hg)	O2(%)	CO2(%)	Temp(C)	Vacuum("Hg)	O2(%)	CO2(%)	Temp(C)	Vacuum("Hg)		
1	17.7	3.6	230	19.1	5.5	15.4	5.2	250	19.4	5.5	15.0	5.5	250	16.6	5.5
2	20.0	1.3	140	18.6	2.0	19.6	1.8	170	*	2	19.0	2.4	200	16.5	5.5
3	17.8	3.5	190	19.5	5.0	17.0	4.0	200	19.8	2	16.7	4.4	220	*	5.5
4	9.0	10.0	220	19.2	2.0	5.7	12.7	230	17.9	2	3.5	14.0	230	20.2	2
5	12.0	8.3	220	18.4	2.0	9.3	10.0	220	20.3	2	1.2	16.2	210	18.7	2
6	17.4	4.6	220	19.5	2.0	15.5	6.5	230	17.6	2	14.2	7.3	230	20.1	5.5
7	15.9	6.4	220	*	7.5	14.0	8.3	230	18.7	5.5	12.5	10.0	230	*	5.5
8	14.7	7.3	220	*	1.5	12.0	10.8	220	20.8	1.5	10.0	13.8	220	*	1.5
9	15.0	6.0	210	*	1.5	12.7	7.9	220	19.8	1.5	11.3	9.2	210	*	2
10	15.7	7.1	220	*	1.5	14.2	8.3	230	20.2	2	14.5	7.3	220	*	6
11	15.8	7.3	230	*	1.5	9.0	15.0	230	20.1	1.5	0.0	23.0	210	*	1.5
12	17.5	9.4	240	*	5.0	14.8	18.4	230	20.0	5	15.8	25.0	220	*	5
13	18.0	21.0	190	*	1.5	19.5	>25	170	23.9	5.5	>25	25.0	170	*	2
14	20.2	7.4	210	*	5.5	20.9	11.6	210	20.4	1.5	25.0	12.8	200	*	1.5
15	18.2	4.0	200	*	5.5	17.0	5.3	210	29.6	2	16.3	5.5	210	*	2
16	17.1	4.3	190	*	1.5	16.0	5.0	200	17.1	1.5	16.0	5.0	200	*	2
17	12.5	9.2	220	*	5.5	11.0	10.5	210	19.6	5.5	11.4	10.4	220	*	7.5
18	7.4	22.0	210	*	5.5	5.0	>25	210	24.2	6	6.5	>25	210	*	5.5
19	15.5	24.0	200	*	1.5	17.0	>25	180	*	1.5	20.5	>25	180	*	2
20				*										*	skipped monitoring point
21				*										*	skipped monitoring point
22				*										*	skipped monitoring point
23				*										*	skipped monitoring point
24	17.0	4.3	200	*	2.0	18.0	3.0	190	18.2	1.5	19.3	1.7	150	*	1.5
25	19.5	1.5	120	*	1.5	19.5	1.4	100	14.8	10	20.8	0.4	20	*	1.5
26	20.3	1.0	70	*	1.5	20.5	0.6	40	15.8	2	20.8	0.5	20	*	2
27	12.5	7.5	200	*	2.0	12.0	7.5	200	19.4	2	16.5	3.8	170	*	2
28	9.0	8.6	210	*	5.5	11.5	7.8	200	21.9	2	16.5	3.8	170	*	5
29	13.3	6.5	240	*	5.5	12.5	6.6	240	21.0	2	17.5	2.6	180	*	5.5
30				*										*	skipped monitoring point
31				*										*	skipped monitoring point
32	no flow	no flow	no flow	*	15.0	5.6	13.5	290	18.0	7	0.0	19.5	4,200	*	2
33	10.8	8.9	250	*	2.0	6.3	12.0	250	18.0	5	0.0	16.0	1,100	*	3
34	17.4	3.7	180	*	5.5	17.0	3.7	190	22.6	5.5	19.0	1.6	130	*	1.5

F.E. Warren AFB Soil Gas Monitoring Data (12/3/94)

Monitoring Point	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Shallow (3.0') TPI(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Middle (5.5') TPI(ppm)	Temp(C)	Vacuum("Hg)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	Deep (8.0') TPI(ppm)	Temp(C)	Vacuum("Hg)	Remarks
1	19.5	1.8	60	3	5.0	19.3	2.2	62	7.5	2.5	18.8	2.3	67	12.0	5.5	
2	20.0	1.0	40	3.3	2.0	20.0	1.0	40	*	6.5	19.5	1.6	60	11.5	6.6	
3	19.8	1.5	50	3.5	4.0	19.2	2.0	63	10.3	3	18.5	2.8	80	*	2.5	
4	14.2	5.8	96	4.5	3.0	12.5	7.3	97	12.6	3	11.5	8.0	96	9.0	3	
5	19.0	2.8	100	3	3.0	11.5	9.5	130	12.5	3	8.7	11.7	130	12.1	3	
6	18.7	3.0	100	3.5	3.0	18.0	3.2	110	12.1	3.5	17.7	3.3	110	7.0	3	
7																skipped monitoring point
8																skipped monitoring point
9	16.3	5.6	120	*	2.5	14.8	7.3	120	13.2	2.5	13.5	8.8	120	*	2.5	
10	18.0	4.3	100	*	3.0	16.8	5.0	110	13.7	2.5	16.5	4.8	120	*	3	
11	17.5	14.6	120	*	3.0	13.5	7.2	110	9.2	3	7.0	12.8	120	*	3	
12	13.0	9.0	110	*	3.0	13.0	10.5	110	6.3	3	16.0	12.5	110	*	3	1. *: has no probe;
13	20.6	11.0	100	*	2.5	22.2	13.7	100	12.2	2	>25	15.5	90	*	2.5	2. TPI values in italic are readings used 1:1
14	18.5	6.3	120	*	3.0	18.0	9.0	110	13.5	3	21.2	10.7	110	*	3	dilutor.
15	18.0	3.4	100	*	3.0	18.7	3.5	105	8.7	3	18.5	3.7	100	*	3	
16	18.9	2.7	100	*	3.0	18.7	2.7	100	*	3	18.8	2.6	100	*	3	
17																skipped monitoring point
18	13.4	8.3	140	*	3.0	12.5	9.0	110	13.7	3	11.5	10.0	110	*	3	
19	19.0	10.7	130	*	5.0	22.0	13.0	120	*	3	>25	14.3	120	*	3	
20				*										*		
21				*										*		skipped monitoring point
22				*										*		skipped monitoring point
23				*										*		skipped monitoring point
24	19.6	1.7	60	*	3.0	19.8	1.2	60	10.6	3	20.0	1.1	45	*	6.5	
25																skipped monitoring point
26																skipped monitoring point
27	16.5	2.6	70	*	3.5	16.0	2.8	70	11.3	4	17.5	1.2	40	*	3	
28	15.0	4.5	90	*	3.0	12.5	7.0	90	14.0	3	13.5	4.0	80	*	6	
29	18.3	2.7	70	*	3.0	17.0	3.6	80	11.9	3.5	19.2	1.8	70	*	3	
30				*										*		
31				*										*		skipped monitoring point
32	no flow	no flow	no flow	*	17.5	7.2	11.0	130	10.9	9	0.2	17.0	2,000	*	5.5	11C smell @ depth 8'
33	16.5	4.0	100	*	3.0	13.0	6.3	90	12.6	4	0.0	15.0	1,000	*	5	11C smell @ depth 8'
34	20.0	1.2	40	*	3.0	19.8	1.3	50	14.7	4	19.5	1.8	50	*	3	

F.E. Warren AFB Soil Gas Monitoring Data (1/18/95)

Monitoring Point	O2(%)	CO2(%)	Shallow (3.0')	Temp(C)	Vacuum("Hg)	O2(%)	CO2(%)	Middle (5.5')	Temp(C)	Vacuum("Hg)	O2(%)	CO2(%)	Deep (8.0')	Temp(C)	Vacuum("Hg)	Remarks
1																skipped monitoring point
2																skipped monitoring point
3																skipped monitoring point
4	14.0	5.6	140	3.3	5.0	11.3	7.4	140	10.2	7	10.0	8.3	150	6.8	7	
5	18.5	2.2	105	2.2	3.0	10	7.7	150	4.6	3	5.4	10.5	150	*	7	
6	15.8	4.3	110	2.5	3.0	14.5	5.0	110	9.8	4	13.6	5.6	110	5.2	3	
7																
8																skipped monitoring point
9																skipped monitoring point
10	16.5	4.5	130	*	5.5	15.3	5.3	130	10.0	5	frozen	frozen	frozen	*	7	
11	15.5	4.5	120	*	3.5	12.6	7.5	130	6.6	7	14.7	2.6	130	*	3.5	1. *: has no probe;
12	16.3	5.3	110	*	6.5	15.3	6.3	120	4.6	5	14.6	6.8	120	*	7	2. TPII values in italic
13	14.2	7.5	120	*	7.5	12.5	9.0	120	8.4	8	10.7	10.8	120	*	6	are readings used 1:1
14	17.4	4.3	110	*	3.0	15.5	6.2	120	9.8	4	14.5	7.3	120	*	4	dilutor.
15	18.7	2.4	90	*	6.5	18.2	2.8	100	7.0	6.5	17.4	3.2	100	*	6	
16	18.3	2.7	100	*	7.0	17.5	3.3	110	*	6	17.2	3.5	120	*	6	
17																skipped monitoring point
18	14.8	6.6	150	*	5.0	13.5	7.8	150	10.0	5	12.5	8.8	150	*	7	
19	13.5	7.8	120	*	4.0	12.0	9.3	110	*	8	10.8	10.5	100	*	4	
20																skipped monitoring point
21	20.9	0.8	47	*	3.0	20.9	0.9	68	7.0	5	21.4	1.2	65	*	3	
22																skipped monitoring point
23	17.2	1.7	80	*	7.0	14.5	2.5	90	7.2	6	13.5	2.9	90	*	7	
24																skipped monitoring point
25	24.5	1.1	70		7.0	34.0	0.8	70	9.3	12	43.0	0.6	50		3.5	
26	98.0	0.1	50		7.0	80.0	0.1	70	8.4	11.5	91.5	0.1	70		7.5	
27	21.5	4.7	100	*	3.5	23.0	5.5	110	6.7	4	24.5	4.8	110	*	4	
28	23.7	5.0	130	*	3.0	30.0	7.3	130	10.6	3.5	50.0	7.5	120	*	4	
29	20.7	4.9	100	*	3.5	23.2	6.8	110	8.6	4	23.8	8.5	110	*	3.5	
30	20.6	0.4	30	*	7.0	20.9	0.5	20	6.6	7	20.8	0.4	40	*	3.5	
31	20.5	0.8	60	*	3.0	20.5	0.5	30	7.6	6.5	20.9	0.4	30	*	5	
32	12.5	5.5	120.0	*	19.0	9.5	8.3	120	8.5	12.5	0.0	16.0	2,000	*	7	11C small @depth 8'
33	18.5	4.0	160	*	7.0	16.5	6.0	200	10.6	8	0.0	13.5	1,000	*	9.5	11C small @depth 8'
34	35.8	4.3	130	*	7.0	37.0	5.3	130	11.4	8	36.0	4.8	140	*	6.5	amb T= -3.1C

**APPENDIX 14**

**COMPARISON OF SOIL GAS MEASUREMENTS USING DIFFERENT FIELD SAMPLING  
METHODS**

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Monitoring Point	[O <sub>2</sub> ], %	[CO <sub>2</sub> ], %	[TPH], ppmv	Sampling Method
26S	19.2	1.3	51	Tedlar bag
	19.2	1.3	53	Direct connect
27S	11.5	6.0	74	Tedlar bag
	11.5	6.0	73	Direct connect
28S	4.3	12.2	-	Tedlar bag
	4.5	12.2	-	Direct connect

Paired t-Test X<sub>1</sub> : Direct Connect [O<sub>2</sub>], % Y<sub>1</sub> : Tedlar bag [O<sub>2</sub>], %

DF:	Mean X - Y:	Paired t value:	Prob. (2-tail):
2	.06667	1	.4226

Paired t-Test X<sub>2</sub> : Direct connect [CO<sub>2</sub>], % Y<sub>2</sub> : Tedlar bag [CO<sub>2</sub>], %

DF:	Mean X - Y:	Paired t value:	Prob. (2-tail):
2	0	.	.

Paired t-Test X<sub>3</sub> : Direct connect [TPH], ppm Y<sub>3</sub> : Tedlar bag [TPH]...

DF:	Mean X - Y:	Paired t value:	Prob. (2-tail):
1	.5	.33333	.7952

Note: 1 case deleted with missing values.



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## **APPENDIX 15**

### **VERIFICATION OF FIELD O<sub>2</sub> AND CO<sub>2</sub> MEASUREMENTS USING GC ANALYSIS**

## Comparison of Field Measured O<sub>2</sub>/CO<sub>2</sub> versus Laboratory Analyzed Canister Sample

To verify the accuracy of field instrument, selected field readings are compared to the analytical results of canister samples collected from the same monitoring points at the same time, as listed in Table 1. A two way paired T-test is performed and the results are included in Appendix A. The t value and probability for O<sub>2</sub> observations are 0.49198 and 0.6378, respectively. The t value and probability for CO<sub>2</sub> observations are 1.8201 and 0.1116, respectively. The results show that the field measured data for O<sub>2</sub> are more consistent with the canister results than those for CO<sub>2</sub>. Overall, the comparison shows that the field O<sub>2</sub> /CO<sub>2</sub> meter is adequately reliable. The field measured data versus laboratory determined data are also plotted as shown in Figure 1 and Figure 2.

Table 1 Comparison of Field Measured and Laboratory Determined O<sub>2</sub>/CO<sub>2</sub>

SAMPLING POINT	SAMPLING TIME	LAB-O <sub>2</sub> (%)	FIELD-O <sub>2</sub> (%)	LAB-CO <sub>2</sub> (%)	FIELD-CO <sub>2</sub> (%)
MP 19 M	8/29/94	11.7	11.8	23.53	≈25
MP 14 D	8/29/94	22.9	23.0	11.96	11.5
MP 18 M	8/29/94	5.7	2.3	22.13	≈25
MP 13 D	8/29/94	21.2	23.6	27.14	≈27
MP 13 S	8/29/94	11.4	10.8	24.67	≈25
MP26D	7/7/94	19.6	19.5	0.00	0.2
Ambient Air	7/7/94	19.5	21	0.00	0.03
M-32d	7/10/94	2.7	0.001	15.44	16.9

Note: LAB-O<sub>2</sub> and LAB-CO<sub>2</sub> are canister samples analyzed by GC at UWRL;  
FIELD-O<sub>2</sub> and FIELD-CO<sub>2</sub> are readings using GasTech O<sub>2</sub> /CO<sub>2</sub> meter Model32520x

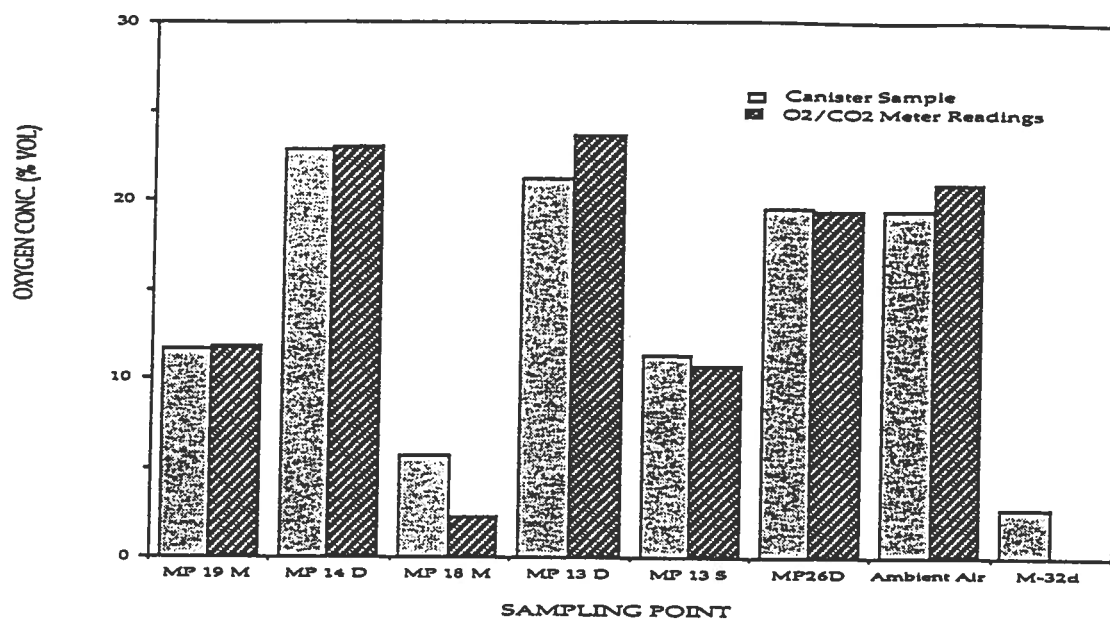


Figure 1 Plot of Field Measured and Laboratory Determined O<sub>2</sub>

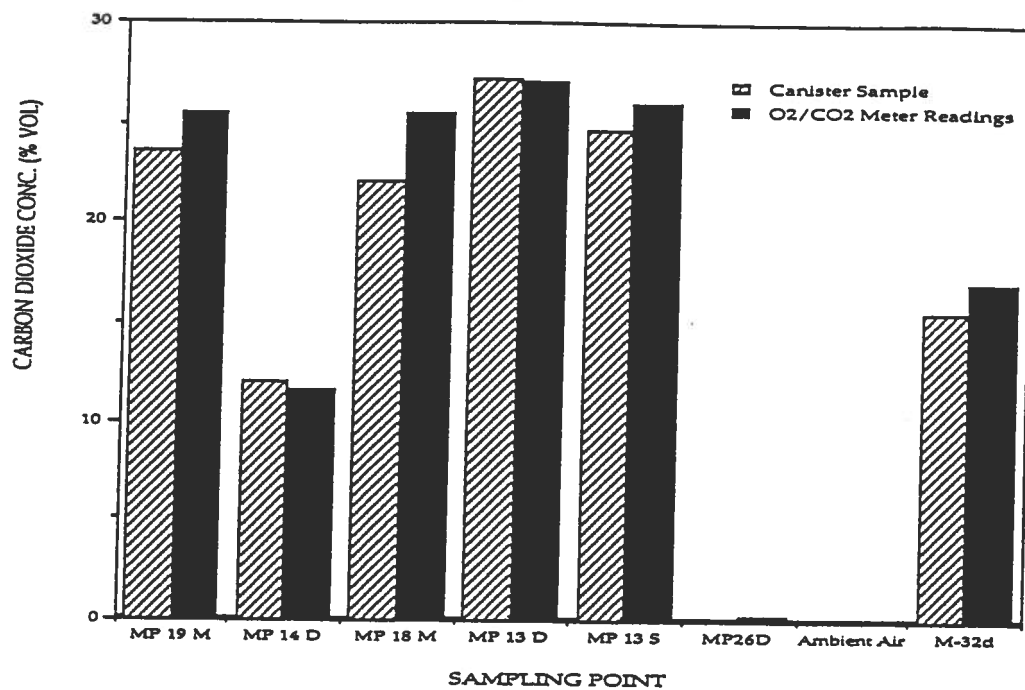


Figure 2 Plot of Field Measured and Laboratory Determined CO<sub>2</sub>

# Two-Tail Paired t-test Results for Lab O2/CO2 v Field O2/CO2

## Paired t-Test X<sub>1</sub>: Lab O2 Y<sub>1</sub>: Field O2

DF:	Mean X - Y:	Paired t value:	Prob. (2-tail):
7	.33737	.49198	.6378

## Paired t-Test X<sub>2</sub>: Lab CO2 Y<sub>2</sub>: Field CO2

DF:	Mean X - Y:	Paired t value:	Prob. (2-tail):
7	-.72	-1.8201	.1116

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**APPENDIX 16**  
**MONTHLY TEMPERATURE AND AIR FLOW DATA**



# FE Warren AFB - Temperature and Flow Data

## Plastic Covered Region

Date:	12/17/93
Time:	2:00 PM
Ambient: (C) 1.0	
T/ C Number	Temp (C)
t1	7.2
t2	*
t3	4.5
t4	8.8
t5	4.1
t6	5.0
t7	7.9
t8	3.8
t9	*
t10	*
t11	8.6
t12	8.0
t13	5.3
t14	3.1
t15	9.9
t16	8.2
t17	5.2
t18	10.1
t19	7.5
t20	11.7
t21	5.3

## Flow Monitoring Points

Date:	12/17/93			
Time:	2:00 PM			
Ambient: (C) 1.0				
Air Flow				
Point	Temp (C)	Velocity	Flow	
F1	pipe broken	(ft/ min)	(ft3/ min)	
F2	pipe broken	pipe broken	pipe broken	
F3	2	700	15.3	
F4	2.5	700	15.3	
F5	1.5	725	15.8	
F6	1.1	270	5.9	
F7	0.7	400	8.7	
F8	0.3	520	11.3	
F9	1.7	700	15.3	
F10	3.9	60	1.3	
F11	3	310	6.8	
F12	4	430	9.4	
F13	0	630	13.7	
F14	pipe broken	pipe broken	pipe broken	
F15	1	230	5.0	
F16	pipe broken	pipe broken	pipe broken	
F17	pipe broken	pipe broken	pipe broken	
F18	pipe broken	pipe broken	pipe broken	
F19	pipe broken	pipe broken	pipe broken	

## Air Injection Points

Date:	12/17/93
Time:	2:30 PM
Ambient: (C) 1.0	
T/ C	Temp
Number	(C)
tc1	1.5
tc2	1.5
tc3	1.4
tc4	4.2
tc5	2.1
tc6	3.4
tc7	1.8
tc8	2.6
tc9	4.2
tc10	n/a
tc11	n/a

\*thermal couples t2, t9 and t10 no longer functioning

# FE Warren AFB - Temperature and Flow Data

## Plastic-Covered Region

Date:	1/15/94
Time:	2:00 PM
Ambient: (C)	8.9
T/ C Number	Temp (C)
t1	7.6
t2	*
t3	4.4
t4	8.7
t5	4.8
t6	5.2
t7	8.1
t8	5.0
t9	*
t10	*
t11	9.6
t12	8.9
t13	6.0
t14	4.7
t15	9.6
t16	7.0
t17	5.8
t18	10.6
t19	6.2
t20	12.1
t21	7.5

## Flow Monitoring Points

Date:	1/15/94		
Time:	2:30 PM		
Ambient: (C) 1.0			
Air Flow			
Point	Temp (C)	Velocity (ft/ min)	Flow (ft3/ min)
F1	9.6	35	0.8
F2	9.2	200	4.4
F3	9.2	430	9.4
F4	9.3	650	14.2
F5	8.7	850	18.5
F6	10.1	160	3.5
F7	9	270	5.9
F8	9.2	400	8.7
F9	9.2	570	12.4
F10	8.5	90	2.0
F11	8.3	230	5.0
F12	8.9	320	7.0
F13	9.5	600	13.1
F14	9.1	180	3.9
F15	9.1	200	4.4
F16	8.9	470	10.3
F17	8.5	480	10.5
F18	9.1	680	14.8
F19	9.8	700	15.3

## Air Injection Points

Date:	1/15/94
Time:	2:30 PM
Ambient: (C)	1.0
T/ C	Temp (C)
tc1	9.3
tc2	1.5
tc3	8.5
tc4	6.5
tc5	8.4
tc6	5.5
tc7	5.5
tc8	4.9
tc9	6.2
tc10	7.9
tc11	4.8

\*thermo couples t2, t9 and t10 no longer functioning

F E Warren AFB - Temperature and Flow Data

Plastic-Covered Region

Date:	2/12/94
Time:	9:00 AM
Ambient: (C) -0.1	
T/ C Number	Temp (C)
t1	5.2
t2	*
t3	1.9
t4	6.1
t5	2.0
t6	2.9
t7	5.4
t8	2.0
t9	*
t10	*
t11	6.4
t12	5.2
t13	2.7
t14	0.7
t15	6.2
t16	3.7
t17	1.8
t18	6.0
t19	3.0
t20	7.3
t21	2.0

Flow Monitoring Points

Date:	2/13/94			
Time:	8:30 AM			
Ambient: (C) -0.5				
Air Flow				
Point	Temp (C)	Velocity (ft/min)	Flow (ft3/min)	
F1	-0.2	65	1.4	
F2	0.7	250	5.5	
F3	3.1	440	9.6	
F4	3.2	600	13.1	
F5	-	-	-	
F6	2.7	190	4.1	
F7	2.4	270	5.9	
F8	2.6	410	8.9	
F9	2.6	620	13.5	
F10	3	70	1.5	
F11	3.8	220	4.8	
F12	3	320	7.0	
F13	4.5	600	13.1	
F14	14.4	200	4.4	
F15	15.1	190	4.1	
F16	8.6	380	8.3	
F17	16.3	350	7.6	
F18	15.3	600	13.1	
F19	15.7	640	14.0	

Air Injection Points

Date:	2/13/94
Time:	9:15 AM
Ambient: (C) 0.2	
T/ C	Temp
Number	(C)
tc1	6.5
tc2	3.7
tc3	5.5
tc4	3.8
tc5	3.6
tc6	0.8
tc7	1.5
tc8	1.6
tc9	0.1
tc10	3.8
tc11	0.4

\*thermocouples t2, t9 and t10 no longer functioning

**F E Warren AFB - Temperature and Flow Data**

**Plastic-Covered Region**

Date:	2/25/94	Date:	2/28/94
Time:	2:18 PM	Time:	1:50 PM
Ambient: (C) -11.9	Ambient: (C) 0.2		
T/ C Number	Temp (C)	T/ C Number	Temp (C)
t1	4.7	t1	5.2
t2	*	t2	*
t3	1.4	t3	1.6
t4	6.3	t4	6.4
t5	1.1	t5	1.5
t6	2.3	t6	2.5
t7	5.4	t7	5.4
t8	1.5	t8	1.8
t9	*	t9	*
t10	*	t10	*
t11	6.7	t11	6.6
t12	5.1	t12	5.2
t13	2.0	t13	2.0
t14	0.0	t14	0.0
t15	6.1	t15	6.1
t16	3.3	t16	3.1
t17	1.5	t17	1.4
t18	6.5	t18	6.3
t19	1.3	t19	2.5
t20	7.3	t20	7.5
t21	2.1	t21	1.7

\*thermo-couples t2, t9 and t10 no longer functioning;

**Flow Monitoring Points**

Date: 2/25/94	
Time: 1:30 PM	
Ambient: (C) -8.3	
Air Flow	
Point	Temp (C)
F1	3.2
F2	1.2
F3	1.6
F4	4.1
F5	7.4
F6	2.7
F7	0.2
F8	0.7
F9	5.1
F10	3.3
F11	3.2
F12	4.8
F13	9.7
F14	8.1
F15	4
F16	3.7
F17	2.6
F18	3.3
F19	4.6

Velocity	Flow
(ft/min)	(ft3/min)
60	1.3
340	7.4
NR	-
NR	-
NR	-
NR	-
NR	-
NR	-
NR	-
110	2.4
380	8.3
500	10.9
700	15.3
600	13.1
260	5.7
650	14.2
600	13.1
760	16.6
800	17.5

NR=off scale due to meter malfunctioning.

**Air Injection Points**

Date:	2/28/94
Time:	2:20 PM
Ambient: (C) -0.8	
T/ C	Temp (C)
tc1	0.6
tc2	-2.4
tc3	-2.7
tc4	-2.6
tc5	-2.2
tc6	-2.3
tc7	-2.9
tc8	-2.5
tc9	-2.6
tc10	-2.5
tc11	-2.4

# FE Warren AFB - Temperature and Flow Data

## Plastic-Covered Region

Date:	3/26/94
Time:	2:05 PM
Ambient: (C) -1.5	
T/ C Number	Temp (C)
t1	6.0
t2	*
t3	5.1
t4	6.3
t5	5.1
t6	5.1
t7	6.0
t8	5.0
t9	*
t10	*
t11	6.4
t12	6.0
t13	6.2
t14	6.7
t15	5.6
t16	6.6
t17	6.8
t18	8.5
t19	6.2
t20	8.2
t21	6.3

## Flow Monitoring Points

Date:	3/26/94		
Time:	1:30 PM		
Ambient: (C) -0.5 to 3.5			
Air Flow		Velocity	Flow
Point	Temp (C)	(ft/min)	(ft3/min)
F1	1.8	80	1.7
F2	**	**	**
F3	**	**	**
F4	**	**	**
F5	**	**	**
F6	5.5	230	5.0
F7	4.2	320	7.0
F8	5.2	450	9.8
F9	6	600	13.1
F10	3.7	80	1.7
F11	5.9	260	5.7
F12	4.5	380	8.3
F13	4.5	650	14.2
F14	-1.4	250	5.5
F15	-2.7	250	5.5
F16	-1.8	250	5.5
F17	-1.5	270	5.9
F18	-2.5	620	13.5
F19	-2.6	620	13.5

## Air Injection Points

Date:	3/26/94
Time:	2:30 PM
Ambient: (C) - 2.8	
T/ C	Temp (C)
tc1	-1.8
tc2	1.4
tc3	-0.4
tc4	-0.6
tc5	0.7
tc6	0.7
tc7	1.1
tc8	0.5
tc9	-0.2
tc10	1.4
tc11	2.6

\*thermocouples t2, t9 and t10 no longer functioning

\*\*meter malfunctioning at freezing temp.

F E Warren AFB - Temperature and Flow Data

Plastic-Covered Region

Date:	4/23/94
Time:	2:55 PM
Ambient: (C) 25	
T/ C Number	Temp (C)
t1	6.2
t2	*
t3	7.2
t4	6.2
t5	7.2
t6	7.1
t7	6.4
t8	7.8
t9	*
t10	*
t11	6.3
t12	7.2
t13	8.5
t14	11.5
t15	7.0
t16	7.1
t17	9.9
t18	8.2
t19	8.6
t20	8.1
t21	11.2

Flow Monitoring Points

Date:	4/23/94		
Time:	1:00 PM		
Ambient: (C) 25.5			
Air Flow		Temp (C)	
Point			
F1		32.9	30
F2		34.8	160
F3		36.6	300
F4		31	490
F5		27.8	750
F6		31.1	120
F7		30.3	210
F8		31.5	320
F9		32.7	470
F10		27.1	60
F11		33.3	180
F12		29.4	260
F13		32.3	580
F14		34.8	170
F15		31.1	160
F16		37.9	170
F17		35.3	190
F18		34.1	490
F19		34.7	500

Air Injection Points

Date:	4/23/94
Time:	1:30 PM
Ambient: (C) 25.5	
T/ C	Temp (C)
tc1	31.3
tc2	8.3
tc3	33.7
tc4	30.9
tc5	33.7
tc6	19.7
tc7	25.5
tc8	25.6
tc9	32.2
tc10	28.6
tc11	20.5

\*thermocouples t2, t9 and t10 no longer functioning

F E Warren AFB - Temperature and Flow Data; 6/3/94

Plastic-Covered Region

Date:	6/3/94
Time:	1:15 PM
Ambient: (C)	24.9
T/ C Number	Temp (C)
t1	10.3
t2	*
t3	16.2
t4	9.8
t5	17.3
t6	15.4
t7	11.7
t8	16.5
t9	*
t10	*
t11	11.5
t12	13.2
t13	16.5
t14	20.4
t15	10.8
t16	14.5
t17	17.3
t18	13.2
t19	17.7
t20	13.7
t21	19.7

\*thermocouples t2, t9 and t10 no longer functioning

Flow Monitoring Points

Date:	6/3/94			
Time:				
Ambient: (C)				
Air Flow	Temp (C)	Velocity	Flow	
Point	(ft/min)	(ft3/min)		
F1	32.6	60	1.3	
F2	42	240	5.2	
F3	37.6	700	15.3	
F4	38.8	720	15.7	
F5	36.7	760	16.6	
F6	30.8	150	3.3	
F7	34.7	220	4.8	
F8	35.2	330	7.2	
F9	40.5	460	10.0	
F10	32.2	65	1.4	
F11	39.1	200	4.4	
F12	34	300	6.5	
F13	37.1	590	12.9	
F14	43	200	4.4	
F15	31.3	200	4.4	
F16	43.1	200	4.4	
F17	36.9	230	5.0	
F18	38.6	460	10.0	
F19	36.2	500	10.9	

\*\*meter malfunctioning at freezing temp.

Air Injection Points

Date:	6/3/94
Time:	
Ambient: (C)	
T/ C	Temp (C)
tc1	29.2
tc2	14.3
tc3	32.8
tc4	32.5
tc5	35.6
tc6	23.1
tc7	27.6
tc8	27.9
tc9	33.5
tc10	31.6
tc11	26.7

# FE Warren A/F Base - Temperature and Flow Data

## Plastic-Covered Region

Date:	7/6/94
Time:	9:50
Ambient: (°C)	24.9
TC Number	Temp (°C)
t1	13.5
t2	*
t3	21.6
t4	19.6
t5	19.4
t6	14.1
t7	*
t8	*
t9	*
t10	*
t11	14.3
t12	18.6
t13	23.4
t14	26.6
t15	*
t16	18.9
t17	22.6
t18	*
t19	21.9
t20	17.5
t21	*

\*thermocouples no longer functioning

## Flow Monitoring Points

Date:	7/6/94		
Time:	7:58 to 9:38		
Ambient: (°C) 21.7 @ 8:11			
Air Flow			
Point	Temp (°C)	Vel (ft/min)	Flow (ft3/min)
F1	30.8	60	1.3
F2	32.6	250	5.5
F3	33.2	700	15.3
F4	34.6	800	17.5
F5	38.2	1,000	21.8
F6	34.8	150	3.3
F7	31.4	225	4.9
F8	28.9	360	7.9
F9	30.5	490	10.7
F10	27.5	50	1.1
F11	27.8	210	4.6
F12	28.3	400	8.7
F13	30.4	650	14.2
F14	26	125	2.7
F15	26.3	260	5.7
F16	28.8	125	2.7
F17	23.5	160	3.5
F18	23.2	500	10.9
F19	23.5	600	13.1

## Air Injection Points

Date:	7/6/94
Time:	8:07 to 9:36
Ambient: (°C)	21.7 @ 8:11
T/C Number	Temp (°C)
tc1	24.2
tc2	19.4
tc3	24.8
tc4	25.6
tc5	30.4
tc6	25.1
tc7	30.2
tc8	24.9
tc9	31.8
tc10	33.9
tc11	30.4



F E Warren AFB - Temperature and Flow Data

Plastic-Covered Region

Date:	8/27/94
Time:	11:15 AM
Ambient: (C) 31.3	
T/ C Number	Temp (C)
t1	16.0
t2	*
t3	23.8
t4	18.3
t5	24.3
t6	23.2
t7	17.5
t8	22.4
t9	*
t10	*
t11	17.6
t12	22.4
t13	25.0
t14	26.1
t15	16.7
t16	22.3
t17	24.5
t18	24.5
t19	25.8
t20	21.0
t21	25.7

Flow Monitoring Points

Date:	8/27/94		
Time:	11:15 AM		
Ambient: (C) 31.3			
Air Flow	Temp (C)	Velocity	Flow
Point	(ft/min)	(ft3/min)	
F1	39.9	90	2.0
F2	41.6	320	7.0
F3	**	**	**
F4	**	**	**
F5	**	**	**
F6	**	**	**
F7	**	**	**
F8	**	**	**
F9	**	**	**
F10	**	**	**
F11	**	**	**
F12	**	**	**
F13	**	**	**
F14	34.4	260	5.7
F15	38.8	190	4.1
F16	38.6	525	11.5
F17	35.6	600	13.1
F18	35.9	750	16.4
F19	37.4	850	18.5

Air Injection Points

Date:	8/27/94
Time:	11:30 AM
Ambient: (C) 33	
T/ C	Temp (C)
tc1	no longer function
tc2	33.4
tc3	33
tc4	35.6
tc5	**
tc6	**
tc7	***
tc8	***
tc9	**
tc10	**
tc11	20.5

\*thermocouples t2, t9 and t10 no longer functioning; \*\*Air injection shut off for pure oxygen & pulse injection;  
 \*\*\*Flow and temperature not measured due to being in "off" phase of pulsed injection.

# F E Warren AFB - Temperature and Flow Data

## Plastic-Covered Region

Date:	9/23/94
Time:	3:30 PM
Ambient: (C)	24.5
T/C Number	Temp (C)
t1	16.7
t2	*
t3	22.0
t4	19.7
t5	21.0
t6	22.2
t7	18.3
t8	19.6
t9	*
t10	*
t11	18.7
t12	22.7
t13	23.5
t14	21.5
t15	18.1
t16	21.8
t17	20.8
t18	21.3
t19	23.4
t20	19.7
t21	19.1

## Flow Monitoring Points

Date:	9/23/94			
Time:	8:30 AM			
Ambient: (C)	15.5			
Air Flow				
Point	Temp (C)	Velocity (ft/min)	Flow (ft3/min)	
F1	30.5	280	6.1	
F2	**	**	**	
F3	**	**	**	
F4	**	**	**	
F5	**	**	**	
F6	#	#	#	
F7	#	#	#	
F8	**	**	**	
F9	**	**	**	
F10	**	**	**	
F11	**	**	**	
F12	**	**	**	
F13	**	**	**	
F14	18.2	210	4.6	
F15	20	180	3.9	
F16	20.9	480	10.5	
F17	18.5	590	12.9	
F18	18.7	725	15.8	
F19	18.4	750	16.4	

## Air Injection Points

Date:	9/23/94
Time:	3:00 PM
Ambient: (C)	24.5
T/C	Temp (C)
Number	
tc1	not reading
tc2	26
tc3	29.5
tc4	27.3
tc5	**
tc6	**
tc7	**
tc8	#
tc9	**
tc10	**
tc11	28.4

\*thermocouples t2, t9 and t10 no longer functioning      \*\*points not sampled due to injection points turned off;  
# Flow and temperature not measured due to being in "off" phase of pulsed injection

**F E Warren AFB - Temperature and Flow Data**

**Plastic Covered Region**

Date:	10/16/94
Time:	
Ambient: (C)	
T/ C Number	Temp (C)
t1	16.5
t2	16.7
t3	18.0
t4	18.9
t5	18.2
t6	19.0
t7	17.7
t8	16.7
t9	*
t10	*
t11	18.4
t12	20.0
t13	18.9
t14	17.6
t15	17.7
t16	19.0
t17	17.6
t18	22.0
t19	19.3
t20	19.6
t21	15.8

\*thermal couples t9 and t10 no longer functioning

**Flow Monitoring Points**

Date:	10/16/94			
Time:				
Ambient: (C)				
Air Flow				
Point	Temp (C)	Vel	Q	
F1	19.5	40	0.9	
F2	21.6	180	3.9	
F3	27.2	430	9.4	
F4	26.9	550	12.0	
F5	23.6	850	18.5	
F6	24.8	170	3.7	
F7	27.1	270	5.9	
F8	26.1	420	9.2	
F9	21.6	550	12.0	
F10	21.3	70	1.5	
F11	24.8	260	5.7	
F12	23	300	6.5	
F13	22	620	13.5	
F14	24.2	200	4.4	
F15	20.4	230	5.0	
F16	18.9	540	11.8	
F17	22	550	12.0	
F18	23	750	16.4	
F19	22	800	17.5	

**Air Injection Points**

Date:	10/16/94
Time:	
Ambient: (C)	
T/ C	Temp (C)
Number	
tc1	18.4
tc2	8.5
tc3	22
tc4	19
tc5	20.7
tc6	15
tc7	16.7
tc8	21.1
tc9	21.5
tc10	23.7
tc11	14.8

**APPENDIX 17**  
**RESPIRATION TEST RAW DATA**

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## In situ Respiration Test Data - FE Warren ...B (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
1-s	4/19/93		13.0	5.7	64	18.0	7.9	
1-s	4/20/93		10.7	9.5	350	6.0	7.8	
1-s	4/20/93		11.0	8.8	390	7.0		
1-s	4/20/93		12.9	7.8	480	5.0		
1-s	4/21/93		13.0	3.0	390	6.0	5.1	
1-s	4/21/93		12.7	6.5	390	5.0		
1-s	4/22/93		11.6	7.8	420	5.5	7.4	
1-s	4/23/93	4:08	12.9	7.4	47	6.0	7.9	
1-s	4/24/93	9:06	13.0	7.0	380	6.0	8.7	
1-m	4/19/93		8.0	8.4	70	19.0	7.2	
1-m	4/20/93		7.9	-	380	6.5	7.1	
1-m	4/20/93		8.0	12.8	420	6.5		
1-m	4/20/93		10.9	9.5	490	5.5		
1-m	4/21/93		11.9	7.5	420	6.5		
1-m	4/21/93		11.5	7.5	420	6.5		
1-m	4/22/93		9.1	9.5	440	6.0	7.4	
1-m	4/23/93	4:08	10.1	9.5	500	6.5	7.2	
1-m	4/24/93	9:06	10.5	8.7	360	6.5	7.4	
1-d	4/19/93		5.5	9.5	72	19.0	7.1	
1-d	4/20/93		5.3	15.0	390	6.5	7.3	
1-d	4/23/93	4:08	7.6	11.0	550	7.0	7.0	
1-d	4/24/93	9:06	8.2	10.2	380	7.0	7.2	

2-s	4/19/93		16.6	5.6	64	7.0	8.0	
2-s	4/20/93		17.0	5.0	260	5.5	7.8	
2-s	4/20/93		17.0	5.5	320	5.5		
2-s	4/20/93		18.0	4.3	380	5.0		
2-s	4/21/93		18.0	3.5	300	4.5	6.0	
2-s	4/21/93		17.5	3.5	270	5.0		
2-s	4/22/93		17.8	3.7	250	5.0	8.0	
2-s	4/23/93	4:05	16.8	4.4	390	6.0	7.8	
2-s	4/24/93	9:04	17.9	3.7	270	7.5	8.9	
2-m	4/19/93		15.5	5.1	73	8.0	7.8	
2-m	4/20/93		15.5	6.7	300	6.0	7.7	
2-m	4/20/93		15.5	7.0	360	6.0		
2-m	4/20/93		16.9	5.3	420	4.5		
2-m	4/21/93		17.0	4.5	340	5.5	6.0	
2-m	4/21/93		16.0	4.8	340	5.5		
2-m	4/22/93		15.2	5.8	340	6.0	8.0	
2-m	4/23/93	4:05	14.7	6.0	440	7.0	7.5	
2-m	4/24/93	9:04	15.5	5.5	340	7.5	7.7	
2-d	4/19/93		14.3	5.9	76	8.0	8.1	
2-d	4/20/93		14.5	7.6	330	6.5	8.0	
2-d	4/20/93		14.5	7.8	370	6.5		
2-d	4/20/93		16.1	6.0	440	5.0		
2-d	4/21/93		16.0	5.2	360	6.0	5.9	
2-d	4/21/93		15.0	5.5	360	5.5		
2-d	4/22/93		13.8	6.7	360	7.0	8.1	
2-d	4/23/93	4:05	13.0	6.9	470	7.0	7.6	
2-d	4/24/93	9:04	13.5	6.5	370	7.5	8.2	

## In situ Respiration Test Data - FE Warren B (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
3-s	4/19/93		16.1	4.3	63	7.5	8.7	
3-s	4/20/93		16.0	5.8	270	6.0	8.1	
3-s	4/20/93		16.0	6.0	330	6.5		
3-s	4/20/93		17.1	4.8	400	5.0		
3-s	4/21/93		17.6	3.8	220	5.0	7.6	
3-s	4/21/93		16.0	3.8	300	5.0		
3-s	4/22/93		16.0	5.0	310	6.5	8.3	
3-s	4/23/93	4:00	18.0	4.2	390	5.0	8.6	
3-s	4/24/93	9:00	18.0	4.0	280	6.5	8.3	
3-m	4/19/93		15.8	4.5	66	9.0	8.4	
3-m	4/20/93		15.8	6.2	280	6.5	8.5	
3-m	4/20/93		15.5	6.5	340	6.5		
3-m	4/20/93		16.9	5.1	410	5.5		
3-m	4/21/93		17.2	4.2	340	5.5	7.4	
3-m	4/21/93		16.1	4.5	316	5.5		
3-m	4/22/93		15.2	5.5	330	6.0	8.5	
3-m	4/23/93	4:00	13.9	5.4	440	6.5	8.2	
3-m	4/24/93	9:00	16.5	5.0	320	6.0	8.7	
3-d	4/19/93		15.0	5.2	70	9.0	8.9	
3-d	4/20/93		15.0	7.0	310	8.5	8.5	
3-d	4/20/93		15.0	7.2	360	8.0		
3-d	4/20/93		16.1	5.9	430	5.5		
3-d	4/21/93		17.6	3.5	360	6.0	7.9	
3-d	4/21/93		16.0	4.9	320	6.0		
3-d	4/22/93		14.8	6.0	350	7.0	9.0	
3-d	4/23/93	4:00	14.8	5.9	450	7.0	8.4	
3-d	4/24/93	9:00	15.5	5.7	340	8.0	8.9	
4-s	4/19/93		14.0	4.5	64	6.5	8.1	
4-s	4/20/93		14.5	6.0	270	5.0	4.9	
4-s	4/20/93		14.0	6.2	340	5.0		
4-s	4/20/93		16.5	4.5	400	5.5		
4-s	4/21/93		16.2	4.0	320	5.0	7.2	
4-s	4/21/93		15.0	4.3	30	5.0		
4-s	4/22/93		13.0	5.2	320	5.0	9.1	
4-s	4/23/93	3:50	12.2	5.6	460	6.0	8.4	
4-s	4/24/93	8:52	12.0	5.3	300	5.5	9.4	
4-m	4/19/93		12.0	13.0	70	1.0	10.2	
4-m	4/20/93		12.0	7.7	310	8.5	9.5	
4-m	4/20/93		11.7	8.0	370	8.5		
4-m	4/20/93		14.5	6.0	440	9.0		
4-m	4/21/93		14.5	5.0	370	8.0	8.8	
4-m	4/21/93		12.9	5.9	360	8.0		
4-m	4/22/93		10.5	7.0	370	8.5	10.0	
4-m	4/23/93	3:50	9.7	7.4	480	8.5	9.7	
4-m	4/24/93	8:52	10.0	7.1	360	10.0	102.0	

## In situ Respiration Test Data - FE Warren AFB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Pressure (in Hg)	Temp (C)	Comments
4-d	4/19/93		9.0	8.3	76	8.5	9.7	
4-d	4/20/93		18.0	3.5	340	7.0	8.6	
4-d	4/20/93		9.0	10.5	400	7.0		
4-d	4/20/93		12.8	7.5	480	8.0		
4-d	4/21/93		12.9	6.2	460	7.0	8.1	
4-d	4/21/93		11.2	7.6	380	6.5		
4-d	4/22/93		8.3	8.9	400	7.5	9.0	
4-d	4/23/93	3:50	8.0	9.1	520	7.5	8.7	
4-d	4/24/93	8:52	8.0	8.8	380	8.0	8.7	

5-s	4/19/93		11.0	9.0	74	20.0	8.2	
5-s	4/20/93		15.2	8.0	330	5.5	7.3	
5-s	4/20/93		16.2	7.9	360	6.0		
5-s	4/20/93		17.5	5.5	420	5.0		
5-s	4/21/93		14.5	6.0	390	5.5	7.4	
5-s	4/21/93		12.0	6.7	400	4.5		
5-s	4/22/93		14.0	7.0	400	5.0	7.7	
5-s	4/23/93	4:17	12.5	7.8	490	5.5	8.3	
5-s	4/24/93	9:11	16.1	6.0	320	6.0	9.2	

5-m	4/19/93		17.8	3.0	75	19.5	7.8	
5-m	4/20/93		7.8	15.0	390	6.0	8.0	
5-m	4/20/93		8.0	15.5	440	7.0		
5-m	4/20/93		11.1	11.0	500	6.0		
5-m	4/21/93		11.0	9.0	440	7.0	7.9	
5-m	4/21/93		10.9	9.0	420	5.0		
5-m	4/22/93		7.5	12.0	470	5.5	7.9	
5-m	4/23/93	4:17	7.2	12.4	540	6.5	7.9	
5-m	4/24/93	9:11	8.0	11.5	400	6.0	8.3	

5-d	4/19/93		4.5	12.0	75	19.2	9.0	
5-d	4/20/93		4.0	19.0	400	8.0	8.5	
5-d	4/24/93	9:11	4.3	14.8	550	7.0	8.7	

6-s	4/19/93		16.0	4.5	42	19.0	8.5	
6-s	4/20/93		16.0	6.0	280	5.5	8.6	
6-s	4/20/93		16.0	6.1	340	5.0		
6-s	4/20/93		17.0	4.8	410	5.0		
6-s	4/21/93		17.1	3.8	300	55.0	89.0	
6-s	4/21/93		16.7	4.9	320	5.5		
6-s	4/22/93		15.5	5.0	360	4.0	8.1	
6-s	4/23/93	4:20	15.0	5.2	420	6.5	8.4	
6-s	4/24/93	9:12	15.0	5.0	300	6.5	9.2	

6-m	4/19/93		16.0	4.5	46	19.0	9.6	
6-m	4/20/93		15.8	6.2	300	9.0	9.7	
6-m	4/20/93		15.5	6.4	350	9.0		
6-m	4/20/93		16.0	5.0	410	9.0		
6-m	4/21/93		17.0	10.0	320	9.0	9.4	
6-m	4/21/93		16.0	4.5	270	8.0		
6-m	4/22/93		14.5	5.8	380	8.0	9.6	
6-m	4/23/93	4:20	13.9	5.8	440	9.5	9.4	
6-m	4/24/93	9:12	14.0	5.7	320	9.5	9.7	



In situ Respiration Test Data - FE Warren B (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
6-d	4/19/93		15.2	4.6	47	19.0	8.8	
6-d	4/20/93		15.0	6.5	310	7.0	8.7	
6-d	4/20/93		15.1	6.5	360	6.0		
6-d	4/20/93		16.5	5.1	420	6.5		
6-d	4/21/93		17.0	4.1	330	6.0	8.8	
6-d	4/21/93		15.9	4.5	260	5.5		
6-d	4/22/93		14.1	6.0	380	5.5	9.0	
6-d	4/23/93	4:20	13.1	6.2	450	7.0	8.8	
6-d	4/24/93	9:12	13.0	6.0	330	7.5	9.0	

7-s	4/19/93		19.0	2.6	44	19.7	8.9	
7-s	4/20/93		18.9	3.5	190	10.0		
7-s	4/20/93		18.0	3.5	240	10.0		
7-s	4/20/93		19.6	2.8	320	8.5		
7-s	4/21/93		19.5	2.4	200	9.0		
7-s	4/21/93		19.1	1.3	180	9.0		
7-s	4/22/93		18.8	3.0	250	9.5		
7-s	4/23/93	4:25	19.2	2.8	300	10.0		
7-s	4/24/93	9:15	18.8	2.7	190	11.0		

7-m	4/19/93		19.0	2.5	44	19.7		
7-m	4/20/93		19.8	3.5	200	6.0	8.4	
7-m	4/20/93		19.0	3.5	240	6.0		
7-m	4/20/93		19.5	2.7	20	5.0		
7-m	4/21/93		19.0	2.5	210	5.0	8.8	
7-m	4/21/93		19.0	2.5	160	5.0		
7-m	4/22/93		18.4	3.2	270	5.0	8.9	
7-m	4/23/93	4:25	18.9	2.8	300	7.0	8.7	
7-m	4/24/93	9:15	18.5	3.0	200	7.0	9.0	

7-d	4/19/93		19.0	2.4	45	20.0		
7-d	4/20/93		18.8	3.3	200	7.0		
7-d	4/20/93		19.0	3.3	240	6.5		
7-d	4/20/93		19.2	2.8	320	5.5		
7-d	4/21/93		19.1	2.5	210	6.0		
7-d	4/21/93		18.9	2.5	140	6.0		
7-d	4/22/93		18.2	3.2	270	6.0		
7-d	4/23/93	4:25	18.2	3.2	320	7.5		
7-d	4/24/93	9:15	18.0	3.0	200	7.0		

8-s	4/19/93		21.0	0.2	0	19.0		
8-s	4/20/93		18.2	4.0	230	5.0		
8-s	4/20/93		18.5	4.1	260	6.5		
8-s	4/20/93		19.0	3.5	350	4.0		
8-s	4/21/93		19.1	2.8	220	7.0		
8-s	4/21/93		19.0	2.7	190	5.0		
8-s	4/22/93		18.5	3.4	250	4.5		
8-s	4/23/93	4:33	19.0	3.2	300	5.5		
8-s	4/24/93	9:16	19.0	3.0	200	5.0		

## In situ Respiration Test Data - FE Warren FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
8-m	4/19/93		19.0	2.6	46	19.0	8.6	
8-m	4/20/93		18.0	4.0	230	6.0	8.6	
8-m	4/20/93		18.1	4.2	280	6.5		
8-m	4/20/93		18.9	3.5	350	4.0		
8-m	4/21/93		19.0	2.8	230	6.0	8.7	
8-m	4/21/93		18.7	2.9	180	5.5		
8-m	4/22/93		18.0	3.7	270	5.5	8.7	
8-m	4/23/93	4:33	18.2	3.7	340	7.0	8.8	
8-m	4/24/93	9:16	18.0	3.5	220	7.0	9.0	
8-d	4/19/93		19.0	2.5	44	20.0		
8-d	4/20/93		18.0	4.0	230	6.5		
8-d	4/20/93		18.0	4.1	280	6.5		
8-d	4/20/93		18.9	3.5	360	4.5		
8-d	4/21/93		19.0	2.9	230	5.0		
8-d	4/21/93		18.5	3.0	160	5.0		
8-d	4/22/93		17.7	3.8	280	6.0		
8-d	4/23/93	4:33	17.8	3.8	350	7.0		
8-d	4/24/93	9:16	17.5	3.5	230	8.5		
9-s	4/19/93		21.0	0.8	17	20.0		
9-s	4/20/93	10:45	20.0	1.3	95	5.0		
9-s	4/20/93	12:35	20.0	1.5	120	5.0		
9-s	4/20/93	15:25	20.2	1.2	220	5.0		
9-s	4/21/93	10:50	20.2	0.8	90	4.5		
9-s	4/21/93	18:30	20.9	0.9		5.0		
9-s	4/22/93	10:35	19.9	1.3	120	4.0		
9-s	4/23/93	4:45	19.7	1.2	160	5.5		
9-s	4/24/93	9:20	19.7	1.3	100	6.0		
9-m	4/19/93		20.5	0.7	17	20.0	8.3	
9-m	4/20/93	10:45	20.6	1.0	70	8.0	8.9	
9-m	4/20/93	12:35	20.2	1.2	120	6.0		
9-m	4/20/93	15:25	20.5	1.0	200	5.5		
9-m	4/21/93	10:50	20.3	0.8	66	5.0	8.2	
9-m	4/21/93	18:30	20.0	0.8		5.5		
9-m	4/22/93	10:35	18.9	1.2	110	5.0	8.3	
9-m	4/23/93	4:45	19.5	1.2	160	7.0	8.2	
9-m	4/24/93	9:20	19.5	1.0	80	7.5	8.7	
9-d	4/19/93		20.5	0.7	17	20.0		
9-d	4/20/93	10:45	20.0	1.0	76	7.5		
9-d	4/20/93	12:35	20.2	1.2	120	6.5		
9-d	4/20/93	15:25	20.5	1.0	200	6.0		
9-d	4/21/93	10:50	20.5	0.8	66	6.0		
9-d	4/21/93	18:30	20.2	0.8		6.0		
9-d	4/22/93	10:35	19.8	1.1	100	5.5		
9-d	4/23/93	4:45	19.5	1.2	160	7.0		
9-d	4/24/93	9:20	18.0	1.0	180	7.0		

In situ Respiration Test Data - FE Warren FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
10-s	4/19/93		17.5	4.3	60	6.5		
10-s	4/20/93		18.0	5.5	250	6.0		
10-s	4/20/93		17.8	5.8	320	5.0		
10-s	4/20/93		19.0	4.2	400	6.0		
10-s	4/21/93		19.0	3.5	310	5.0		
10-s	4/21/93		18.5	3.8	280	4.5		
10-s	4/22/93		17.9	4.5	300	5.0		
10-s	4/23/93	3:43	17.4	4.5	400	6.0		
10-s	4/24/93	8:30	17.5	4.3	280	6.0		
10-m	4/19/93		18.0	4.0	60	7.5		
10-m	4/20/93		17.9	5.0	260	8.0		
10-m	4/20/93		17.8	5.2	310	7.0		
10-m	4/20/93		18.9	4.0	390	8.0		
10-m	4/21/93		18.8	3.5	300	7.0	8.8	
10-m	4/21/93		18.0	3.9	280	6.5		
10-m	4/22/93		17.0	4.5	300	7.0	9.7	
10-m	4/23/93	3:43	16.6	4.8	410	8.0	9.6	
10-m	4/24/93	8:30	16.8	4.5	300	8.0	9.8	
10-d	4/19/93		19.0	3.0	50	8.0	9.7	
10-d	4/20/93		17.5	3.9	220	9.5	9.8	
10-d	4/20/93		18.0	4.2	280	8.0		
10-d	4/20/93		19.0	3.2	360	8.5		
10-d	4/21/93		18.5	3.2	290	8.0		
10-d	4/21/93		18.0	3.5	270	7.0		
10-d	4/22/93		17.0	4.5	30	8.0		
10-d	4/23/93	3:43	16.3	4.8	420	8.0		
10-d	4/24/93	8:30	16.1	4.7	300	9.0		
11-s	4/19/93		14.0	5.5	68	5.5		
11-s	4/20/93		15.0	6.0	310	5.5		
11-s	4/20/93		13.5	7.5	340	6.0		
11-s	4/20/93		15.5	5.9	440	5.5		
11-s	4/21/93		15.1	5.0	360	5.0		
11-s	4/21/93		14.8	5.0	330	5.0		
11-s	4/22/93		13.0	6.2	340	5.0		
11-s	4/23/93	3:37	12.8	6.5	44	5.5		
11-s	4/24/93	8:28	13.0	6.0	330	6.5		
11-m	4/19/93		12.5	6.0	80	9.5		
11-m	4/20/93		12.2	7.8	320	9.0		
11-m	4/20/93		12.3	8.0	350	8.5		
11-m	4/20/93		14.9	6.0	450	9.0		
11-m	4/21/93		13.0	5.7	380	8.5	8.7	
11-m	4/21/93		11.8	6.0	360	7.5		
11-m	4/22/93		9.0	5.0	360	7.5	100.0	
11-m	4/23/93	3:37	8.6	7.8	480	8.5	9.2	
11-m	4/24/93	8:28	8.7	7.9	360	9.0	9.7	
11-d	4/19/93		2.0	10.0	79	7.5	9.5	
11-d	4/20/93		1.5	14.5	400	7.0	9.4	

In situ Respiration Test Data - FE Warren AFB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Prt (in Hg)	Temp (C)	Comments
12-s	4/19/93		19.0	3.2	50	5.5		
12-s	4/20/93		18.3	3.8	220	6.5		
12-s	4/20/93		18.2	4.0	240	5.0		
12-s	4/20/93		19.1	3.2	340	5.0		
12-s	4/21/93		19.2	2.3	230	6.0		
12-s	4/21/93		18.8	2.8	220	5.0		
12-s	4/22/93		18.0	3.2	220	5.0		
12-s	4/23/93	3:34	17.7	3.3	300	6.0		
12-s	4/24/93	8:26	18.0	3.0	220	5.5		
12-m	4/19/93		18.5	3.3	56	6.5		
12-m	4/20/93		18.2	4.0	220	7.0		
12-m	4/20/93		18.0	4.3	250	6.0		
12-m	4/20/93		18.9	3.5	350	6.0		
12-m	4/21/93		18.8	2.8	260	6.5	8.8	
12-m	4/21/93		18.0	3.0	240	6.0		
12-m	4/22/93		17.0	3.7	260	7.0	9.0	
12-m	4/23/93	3:34	16.7	3.9	350	6.0	8.6	
12-m	4/24/93	8:26	16.7	3.8	260	6.5	9.1	
12-d	4/19/93		18.5	3.0	52	6.5	8.7	
12-d	4/20/93		18.0	3.8	220	8.0	8.8	
12-d	4/20/93		18.0	4.0	230	7.5		
12-d	4/20/93		18.9	3.3	350	6.0		
12-d	4/21/93		18.5	2.8	260	6.5		
12-d	4/21/93		18.0	3.0	250	6.5		
12-d	4/22/93		17.0	3.7	260	6.5		
12-d	4/23/93	3:34	16.3	4.0	360	7.0		
12-d	4/24/93	8:26	16.2	4.0	260	7.5		
13-s	4/19/93		18.5	3.7	54	5.0		
13-s	4/20/93		18.0	4.5	230	6.0		
13-s	4/20/93		17.6	4.7	280	4.0		
13-s	4/20/93		18.8	3.7	240	6.0		
13-s	4/21/93		18.5	3.3	280	5.5		
13-s	4/21/93		18.0	3.5	260	4.0		
13-s	4/22/93		16.9	4.1	270	5.0		
13-s	4/23/93	3:29	15.0	4.5	370	5.5		
13-s	4/24/93	8:24	16.0	4.2	280	7.0		
13-m	4/19/93		18.8	3.3	50	6.5		
13-m	4/20/93		18.0	4.0	230	7.0		
13-m	4/20/93		18.0	4.3	260	6.0		
13-m	4/20/93		19.0	3.5	220	6.0		
13-m	4/21/93		18.3	3.2	270	5.5	9.2	
13-m	4/21/93		17.8	3.2	260	55.0		
13-m	4/22/93		16.5	4.0	260	5.5	9.0	
13-m	4/23/93	3:29	15.7	4.2	370	6.5	8.8	
13-m	4/24/93	8:24	15.5	4.0	270	7.0	9.1	

In situ Respiration Test Data - FE Warren AFB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Pres (in Hg)	Temp (C)	Comments
13-d	4/19/93		19.5	1.7	34	6.0	8.8	
13-d	4/20/93		19.2	2.3	160	8.0	9.0	
13-d	4/20/93		19.2	2.5	170	7.0		
13-d	4/20/93		19.8	2.0	140	6.6		
13-d	4/21/93		18.9	1.8	180	7.0		
13-d	4/21/93		18.3	1.8	180	6.0		
13-d	4/22/93		17.0	2.5	190	6.5		
13-d	4/23/93	3:29	16.0	2.8	200	7.5		
13-d	4/24/93	8:24	15.5	2.8	200	7.5		

14-s	4/19/93		19.5	2.0	42	6.5		
14-s	4/20/93		19.0	2.8	180	6.0		
14-s	4/20/93		19.0	2.6	180	6.0		
14-s	4/20/93		19.5	2.5	170	6.0		
14-s	4/21/93		19.7	1.6	160	5.0		
14-s	4/21/93		19.0	2.1	190	5.0		
14-s	4/22/93		18.9	2.5	180	5.0		
14-s	4/23/93	3:35	18.7	2.5	260	5.5		
14-s	4/24/93	8:21	18.5	2.3	180	6.0		
14-m	4/19/93		19.3	2.5	49	7.0		
14-m	4/20/93		19.0	3.3	190	6.5		
14-m	4/20/93		18.5	3.5	220	5.0		
14-m	4/20/93		19.2	2.7	190	6.5		
14-m	4/21/93		19.1	2.3	220	5.5	8.4	
14-m	4/21/93		18.7	2.5	210	5.5		
14-m	4/22/93		18.3	3.0	220	6.0	9.5	
14-m	4/23/93	3:35	17.5	3.3	320	6.5	8.6	
14-m	4/24/93	8:21	17.2	2.3	230	7.0	9.1	
14-d	4/19/93		19.0	2.5	46	7.0	9.0	
14-d	4/20/93		19.0	3.2	190	7.0	8.8	
14-d	4/20/93		18.6	3.2	220	7.0		
14-d	4/20/93		19.5	2.7	180	6.5		
14-d	4/21/93		18.1	2.3	210	6.0		
14-d	4/21/93		18.7	2.5	220	6.0		
14-d	4/22/93		18.0	3.0	20	6.5		
14-d	4/23/93	3:35	17.3	3.3	320	7.0		
14-d	4/24/93	8:21	17.1	3.1	230	6.5		

15-s	4/19/93	15:20	19.5	2.3	42	5.0		
15-s	4/20/93		19.5	2.8	180	5.0		
15-s	4/20/93		19.5	3.0	180	4.0		
15-s	4/20/93		19.8	2.5	180	5.0		
15-s	4/21/93		20.0	1.5	200	5.0		
15-s	4/21/93		19.5	2.6	160	5.0		
15-s	4/22/93		19.1	2.4	170	4.5		
15-s	4/23/93	3:08	19.1	2.5	240	5.5		
15-s	4/24/93	8:07	19.1	1.2	180	6.0		

In situ Respiration Test Data - FE Warren FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
15-m	4/19/93	15:20	20.0	2.0	40	6.0		
15-m	4/20/93		19.5	2.5	180	6.5		
15-m	4/20/93		19.5	2.8	180	5.0		
15-m	4/20/93		20.0	2.1	180	6.0		
15-m	4/21/93		20.0	1.5	200	6.5	9.5	
15-m	4/21/93		19.5	1.9	160	5.5		
15-m	4/22/93		19.0	2.3	170	5.0	9.4	
15-m	4/23/93	3:08	19.1	2.3	230	6.0	8.8	
15-m	4/24/93	8:07	19.0	2.2	180	7.0	9.2	
15-d	4/19/93	15:20	20.5	1.0	23	6.0	9.0	
15-d	4/20/93		20.0	1.5	120	6.5	8.8	
15-d	4/20/93		19.8	1.8	120	5.0		
15-d	4/20/93		20.0	1.5	110	6.5		
15-d	4/21/93		20.0	1.0	160	6.5		
15-d	4/21/93		19.9	1.3	120	5.5		
15-d	4/22/93		19.5	1.8	140	5.0		
15-d	4/23/93	3:08	19.0	2.0	220	6.0		
15-d	4/24/93	8:07	19.0	1.9	160			
16-s	4/19/93	16:25	20.0	2.0	36	6.0		
16-s	4/20/93		19.5	2.5	170	5.0		
16-s	4/20/93		18.3	2.7	180	5.5		
16-s	4/20/93		19.8	2.3	160	5.0		
16-s	4/21/93		20.0	1.3	200	5.0		
16-s	4/21/93		19.5	1.9	160	5.0		
16-s	4/22/93		19.0	2.5	180	4.5		
16-s	4/23/93	3:09	18.9	2.5	240	5.0		
16-s	4/24/93	8:10	19.0	2.5	200	5.0		
16-m	4/19/93	16:25	20.0	1.5	30	6.0		
16-m	4/20/93		19.7	1.8	140	6.5		
16-m	4/20/93		19.5	2.0	150	5.0		
16-m	4/20/93		20.0	1.7	130	6.0		
16-m	4/21/93		21.0	0.2	180	6.5	10.0	
16-m	4/21/93		19.5	1.5	130	5.5		
16-m	4/22/93		19.0	2.0	160	5.5	9.3	
16-m	4/23/93	3:09	18.0	0.8	230	5.5	9.3	
16-m	4/24/93	8:10	18.7	2.0	180	5.5	9.6	
16-d	4/19/93	16:25	20.5	1.0	24	7.0	9.4	
16-d	4/20/93		20.0	1.3	110	7.5	9.6	
16-d	4/20/93		19.9	1.5	120	6.0		
16-d	4/20/93		20.3	1.3	100	7.5		
16-d	4/21/93		20.0	1.0	150	6.5		
16-d	4/21/93		18.8	1.2	100	6.5	9.4	
16-d	4/22/93		19.0	1.7	140	7.0		
16-d	4/23/93	3:09	18.9	1.9	20	6.5		
16-d	4/24/93	8:10	18.8	1.8	180	7.0		

In situ Respiration Test Data - FE War AFB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
17-s	4/19/93	16:27	19.0	2.8	50	7.0		
17-s	4/20/93		19.8	3.7	230	5.0		
17-s	4/20/93		18.5	3.8	230	4.0		
17-s	4/20/93		19.1	3.0	210	4.0		
17-s	4/21/93		19.3	2.4	240	5.0		
17-s	4/21/93		18.8	2.8	220	4.5		
17-s	4/22/93		18.0	2.3	220	4.0		
17-s	4/23/93	3:15	17.5	3.5	330	5.0		
17-s	4/24/93	8:14	17.1	3.5	260	6.0		
17-m	4/19/93	16:27	18.5	2.3	44	6.0		
17-m	4/20/93		18.0	2.8	200	6.0		
17-m	4/20/93		18.9	3.0	200	4.5		
17-m	4/20/93		19.2	2.5	180	5.5		
17-m	4/21/93		19.2	2.0	210	5.5	9.4	
17-m	4/21/93		18.7	2.4	20	5.0		
17-m	4/22/93		18.0	3.0	220	5.0	9.3	
17-m	4/23/93	3:15	17.2	3.3	320	6.0	9.4	
17-m	4/24/93	8:14	17.1	3.3	260	7.0	9.8	
17-d	4/19/93	16:27	19.8	1.7	38	6.5	9.3	
17-d	4/20/93		19.3	2.2	170	6.6	0.6	
17-d	4/20/93		19.1	2.3	160	5.0		
17-d	4/20/93		19.5	2.0	150	5.5		
17-d	4/21/93		19.4	1.8	20	6.0		
17-d	4/21/93		18.9	2.1	180	5.0		
17-d	4/22/93		18.0	2.9	220	6.0		
17-d	4/23/93	3:15	17.3	3.2	320	6.5		
17-d	4/24/93	8:14	17.1	4.0	250	7.0		
18-s	4/19/93	16:30	16.0	5.0	68	6.0		
18-s	4/20/93		16.5	6.3	320	6.5		
18-s	4/20/93		17.0	6.0	30	5.5		
18-s	4/20/93		18.0	4.6	260	6.0		
18-s	4/21/93		18.3	3.7	300	6.0		
18-s	4/21/93		17.9	4.0	300	5.0		
18-s	4/22/93		16.9	4.7	300	5.0		
18-s	4/23/93	2:17	16.4	4.5	390	6.0		
18-s	4/24/93	8:16	17.0	4.3	290	7.0		
18-m	4/19/93	16:30	15.5	5.3	70	7.0		
18-m	4/20/93		15.3	7.0	330	6.5		
18-m	4/20/93		15.3	7.2	340	5.5		
18-m	4/20/93		17.0	5.5	300	6.0		
18-m	4/21/93		16.8	4.7	350	6.0	9.1	
18-m	4/21/93		16.0	5.0	340	5.0		
18-m	4/22/93		14.5	6.2	360	5.5	10.1	
18-m	4/23/93	2:17	13.9	6.5	450	6.5	0.7	
18-m	4/24/93	8:16	14.0	6.2	350	7.5	9.9	

In situ Respiration Test Data - FE Warren AFB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump F (in Hg)	Temp (C)	Comments
18-d	4/19/93	16:30	16.5	4.5	70	8.0	9.8	
18-d	4/20/93		16.0	6.0	320	7.0	9.9	
18-d	4/20/93		16.0	7.3	320	6.0		
18-d	4/20/93		17.3	4.8	280	6.5		
18-d	4/21/93		16.6	4.3	340	6.0		
18-d	4/21/93		16.0	4.5	340	5.5		
18-d	4/22/93		14.5	6.8	350	5.5		
18-d	4/23/93	2:17	13.8	6.0	460	6.5		
18-d	4/24/93	8:16	16.7	6.0	360	7.0		

19-s	4/19/93	16:33	19.0	2.5	48	7.0		
19-s	4/20/93		18.5	3.5	230	6.5		
19-s	4/20/93		18.5	3.8	220	4.5		
19-s	4/20/93		19.0	3.0	200	5.0		
19-s	4/21/93		18.8	2.4	240	6.0		
19-s	4/21/93		18.0	2.8	220	4.0		
19-s	4/22/93		16.9	3.5	240	5.0		
19-s	4/23/93	3:21	15.7	3.8	340	5.0		
19-s	4/24/93	8:18	15.5	4.2	360	6.0		
19-m	4/19/93	16:33	19.5	2.3	42	6.0		
19-m	4/20/93		18.8	3.0	20	5.5		
19-m	4/20/93		18.5	3.2	200	8.0		
19-m	4/20/93		19.0	2.7	180	9.0		
19-m	4/21/93		18.8	2.2	220	8.5	9.2	
19-m	4/21/93		18.0	2.5	210	8.0		
19-m	4/22/93		16.5	3.2	220	8.0	9.5	
19-m	4/23/93	3:21	15.5	3.5	330	8.5	9.4	
19-m	4/24/93	8:18	15.0	3.5	350	9.5	9.6	
19-d	4/19/93	16:33	19.2	2.3	42	8.0	9.6	
19-d	4/20/93		20.0	0.5	60	20.5	9.4	
19-d	4/20/93		18.8	3.0	200	5.0		
19-d	4/20/93		14.5	2.5	170	7.0		
19-d	4/21/93		18.0	2.0	200	6.5		
19-d	4/21/93		18.2	2.2	200	6.0		
19-d	4/22/93		17.0	3.0	210	6.0		
19-d	4/23/93	3:21	15.9	3.2	320	7.0		
19-d	4/24/93	8:18	15.1	3.3	230	7.5		

20-s	4/19/93	16:15	20.7	1.0	22	5.5		
20-s	4/20/93		20.3	1.2	94	5.0		
20-s	4/20/93		20.6	1.5	96	4.5		
20-s	4/20/93		20.5	1.2	66	5.0		
20-s	4/21/93		20.5	0.9	110	5.0		
20-s	4/21/93		20.3	0.9	90	4.5		
20-s	4/22/93		20.0	1.2	100	4.0		
20-s	4/23/93	3:03	20.0	1.2	140	5.0		
20-s	4/24/93	8:06	20.0	1.0	98	6.0		



## In situ Respiration Test Data - FE Warren - FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
20-m	4/19/93	16:15	20.9	0.7	14	8.5		
20-m	4/20/93		20.5	0.7	60	8.0		
20-m	4/20/93		20.5	1.0	68	7.0		
20-m	4/20/93		20.5	0.8	44	8.0		
20-m	4/21/93		20.8	0.8	70	8.0	9.7	
20-m	4/21/93		20.5	0.7	48	7.5		
20-m	4/22/93		20.8	0.8	80	7.0	7.8	
20-m	4/23/93	3:03	20.0	0.9	120	8.0	7.9	
20-m	4/24/93	8:06	20.0	0.8	68	9.0	8.2	
20-d	4/19/93	16:15	20.8	0.5	2	8.0	8.1	
20-d	4/20/93		20.8	0.5	20	6.5	7.7	
20-d	4/20/93		20.7	0.6	30	5.5		
20-d	4/20/93		20.8	0.6	32	6.5		
20-d	4/21/93		20.9	0.6	28	7.0		
20-d	4/21/93		20.8	0.6	12	6.0		
20-d	4/22/93		20.2	0.6	60	6.0		
20-d	4/23/93	3:03	20.1	0.7	80	7.0		
20-d	4/24/93	8:06	20.0	0.6	38	7.5		

21-s	4/19/93	16:10	20.5	1.5	22	6.0		
21-s	4/20/93		20.6	1.5	130	6.5		
21-s	4/20/93		20.0	1.8	110	5.0		
21-s	4/20/93		20.2	1.5	120	6.0		
21-s	4/21/93		20.5	1.0	100	5.5		
21-s	4/21/93		20.1	1.2	100	5.0		
21-s	4/22/93		20.0	1.5	64	5.0		
21-s	4/23/93	2:58	20.0	1.5	160	6.0		
21-s	4/24/93	8:03	20.0	1.3	140	7.0		
21-m	4/19/93	16:10	20.9	1.1	20	9.0		
21-m	4/20/93		20.2	1.3	110	9.0		
21-m	4/20/93		20.0	1.6	90	8.5		
21-m	4/20/93		20.5	1.2	100	9.0		
21-m	4/21/93		20.2	0.9	90	9.0	9.6	
21-m	4/21/93		20.2	1.0	80	8.5		
21-m	4/22/93		20.0	1.3	100	8.5	8.0	
21-m	4/23/93	2:58	19.8	1.3	160	9.5	7.7	
21-m	4/24/93	8:03	20.0	1.0	120	9.5	8.2	
21-d	4/19/93	16:10	20.9	0.7	60	7.0	7.8	
21-d	4/20/93		20.8	0.7	44	6.5	8.2	
21-d	4/20/93		20.5	0.8	22	5.0		
21-d	4/20/93		20.7	0.7	60	5.0		
21-d	4/21/93		20.8	0.7	32	6.0		
21-d	4/21/93		20.5	0.6	32	6.0		
21-d	4/22/93		20.1	0.7	60	5.5		
21-d	4/23/93	2:58	20.0	0.8	110	7.0		
21-d	4/24/93	8:03	20.0	0.7	47	7.0		

## In situ Respiration Test Data - FE Warr FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
22-s	4/19/93	16:05	18.0	2.5	60	70.0		
22-s	4/20/93		18.0	3.2	200	6.5		
22-s	4/20/93		18.0	3.5	200	4.5		
22-s	4/20/93		18.5	2.8	200	5.0		
22-s	4/21/93		19.0	2.1	240	5.0		
22-s	4/21/93		18.3	2.5	200	4.5		
22-s	4/22/93		17.8	3.0	290	4.0		
22-s	4/23/93	2:55	17.3	3.1	2820	4.5		
22-s	4/24/93	8:02	17.9	3.0	230	5.0		
22-m	4/19/93	16:05	19.2	1.5	10	6.0		
22-m	4/20/93		18.0	1.8	140	6.5		
22-m	4/20/93		18.9	2.0	130	5.0		
22-m	4/20/93		19.2	1.8	150	6.0		
22-m	4/21/93		19.3	1.3	160	7.0	9.3	
22-m	4/21/93		18.8	1.5	140	6.0		
22-m	4/22/93		18.0	2.0	240	5.0	8.6	
22-m	4/23/93	2:55	17.7	2.2	220	6.5	8.9	
22-m	4/24/93	8:02	17.9	2.0	180	6.5	9.2	
22-d	4/19/93	16:05	19.6	0.9	20	7.5	9.3	
22-d	4/20/93		19.5	1.2	110	7.0	9.0	
22-d	4/20/93		19.4	1.3	100	6.0		
22-d	4/20/93		19.8	1.1	110	8.0		
22-d	4/21/93		19.7	1.0	101	7.0		
22-d	4/21/93		19.1	1.0	110	7.0		
22-d	4/22/93		18.5	1.5	200	6.0		
22-d	4/23/93	2:55	18.0	1.7	190	7.5		
22-d	4/24/93	8:02	18.0	1.5	150	7.0		
23-s	4/19/93	15:50	19.5	1.5	100	5.0		
23-s	4/20/93		19.0	2.5	170	5.5		
23-s	4/20/93		18.9	2.5	180	5.0		
23-s	4/20/93		19.4	1.9	200	6.5		
23-s	4/21/93		18.8	1.5	170	6.0		
23-s	4/21/93		18.8	1.8	170	5.0		
23-s	4/22/93		19.0	2.0	190	5.5		
23-s	4/23/93		17.7	2.5	240	5.0		
23-s	4/24/93	7:58	18.5	2.0	180	5.0		
23-m	4/19/93	15:50	19.0	1.4	110	9.0		
23-m	4/20/93		19.0	2.4	170	9.0		
23-m	4/20/93		18.8	2.5	170	8.5		
23-m	4/20/93		19.5	1.9	160	9.0		
23-m	4/21/93		19.2	1.5	170	9.0	8.7	
23-m	4/21/93		18.5	1.8	160	8.5		
23-m	4/22/93		17.9	2.0	240	7.5	8.3	
23-m	4/23/93		17.0	2.3	230	8.5	8.5	
23-m	4/24/93	7:58	17.0	2.0	190	9.5	8.7	

In situ Respiration Test Data - FE Warr FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
23-d	4/19/93	15:50	18.5	1.0	80	6.5	8.4	
23-d	4/20/93		19.5	1.4	100	7.0	8.4	
23-d	4/20/93		19.2	1.7	130	6.5		
23-d	4/20/93		19.8	1.3	120	7.0		
23-d	4/21/93		19.5	1.2	150	7.0		
23-d	4/21/93		18.8	1.5	140	6.5		
23-d	4/22/93		17.9	2.9	20	6.0		
23-d	4/23/93		17.0	2.3	220	6.0		
23-d	4/24/93	7:58	16.8	2.1	220	5.0		

24-s	4/19/93	15:45	18.5	3.8	170	6.0		
24-s	4/20/93		18.0	3.6	220	5.5		
24-s	4/20/93		18.1	3.9	240	5.0		
24-s	4/20/93		18.7	3.3	260	5.5		
24-s	4/21/93		19.0	2.5	260	6.0		
24-s	4/21/93		18.0	2.9	230	5.0		
24-s	4/22/93		19.0	3.3	250	4.5		
24-s	4/23/93	2:45	16.3	3.7	280	5.0		
24-s	4/24/93	7:56	16.0	3.5	260	5.0		
24-m	4/19/93	15:45	19.0	2.1	140	7.0		
24-m	4/20/93		18.8	2.8	120	6.5		
24-m	4/20/93		18.6	3.1	200	5.5		
24-m	4/20/93		19.0	2.5	230	6.0		
24-m	4/21/93		19.1	2.0	240	6.0	9.8	
24-m	4/21/93		18.0	2.0	210	5.5		
24-m	4/22/93		17.0	2.9	230	5.0	9.7	
24-m	4/23/93	2:45	16.0	3.3	260	6.0	9.4	
24-m	4/24/93	7:56	15.5	3.1	240	6.0	9.9	
24-d	4/19/93	15:45	20.0	1.2	90	7.5	9.7	
24-d	4/20/93		19.8	0.8	140	7.0	9.6	
24-d	4/20/93		19.2	3.2	180	6.0		
24-d	4/20/93		19.5	1.9	200	6.0		
24-d	4/21/93		19.1	1.7	200	6.5		
24-d	4/21/93		18.2	2.0	190	6.0		
24-d	4/22/93		17.0	2.5	220	5.0		
24-d	4/23/93	2:45	16.1	3.0	260	6.5		
24-d	4/24/93	7:56	16.0	3.0	240	6.0		

25-s	4/19/93	15:15	20.5	1.0	110	5.5		
25-s	4/20/93		20.0	1.7	94	20.0		
25-s	4/20/93		19.8	2.5	190	5.0		
25-s	4/20/93		20.0	1.9	200	5.5		
25-s	4/21/93		20.0	1.1	170	5.5		
25-s	4/21/93		19.8	1.8	130	5.0		
25-s	4/22/93		19.5	2.0	160	5.0		
25-s	4/23/93	2:31	19.5	2.1	200	5.6		
25-s	4/24/93	7:46	19.9	1.9	170	5.0		

In situ Respiration Test Data - FE Warren FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
25-m	4/19/93	15:15	19.5	0.7	80	17.0		
25-m	4/20/93		20.0	0.9	38	20.0		
25-m	4/20/93		19.7	1.5	140	17.0		
25-m	4/20/93		20.0	1.1	160	17.5		
25-m	4/21/93		20.0	0.7	100	18.0	8.3	
25-m	4/21/93		20.0	1.0	72	17.0		
25-m	4/22/93		19.7	1.0	120	17.5	8.7	
25-m	4/23/93	2:31	19.5	1.2	130	17.5	7.8	
25-m	4/24/93	7:46	20.0	1.0	100	17.0	8.3	
25-d	4/19/93	15:15	20.9	0.6	40	7.0	8.6	
25-d	4/20/93		20.5	0.7	12	20.0	8.3	
25-d	4/20/93		20.5	0.8	100	6.0		
25-d	4/20/93		20.8	0.7	110	7.5		
25-d	4/21/93		20.8	0.5	56	7.0		
25-d	4/21/93		20.5	0.7	36	6.0		
25-d	4/22/93		20.2	0.7	72	6.5		
25-d	4/23/93	2:31	20.2	0.8	100	6.0		
25-d	4/24/93	7:46	20.3	0.7	70	8.5		

26-s	4/19/93	15:20	20.9	0.8	60	7.5		
26-s	4/20/93		20.5	0.9	44	20.4		
26-s	4/20/93		20.2	1.3	100	7.0		
26-s	4/20/93		20.5	1.0	140	5.0		
26-s	4/21/93		20.7	0.7	110	5.0		
26-s	4/21/93		20.1	1.0	63	5.0		
26-s	4/22/93		20.0	1.0	80	5.0		
26-s	4/23/93	2:35	20.0	1.3	150	5.5		
26-s	4/24/93	7:48	20.0	1.0	110	6.0		
26-m	4/19/93	15:20	20.9	0.7	60	8.0		
26-m	4/20/93		20.7	0.8	42	20.5		
26-m	4/20/93		20.5	1.0	90	7.0		
26-m	4/20/93		20.5	0.8	130	7.5		
26-m	4/21/93		20.8	0.7	80	6.5	8.8	
26-m	4/21/93		20.3	0.8	40	6.0		
26-m	4/22/93		20.0	0.8	56	6.5	9.4	
26-m	4/23/93	2:35	20.0	1.0	120	6.0	9.2	
26-m	4/24/93	7:48	20.0	0.8	80	7.0	8.8	
26-d	4/19/93	15:20	20.9	0.6	30	8.0	8.8	
26-d	4/20/93		20.7	0.7	24	20.6	8.5	
26-d	4/20/93		20.5	0.8	80	7.0		
26-d	4/20/93		20.7	0.7	100	7.0		
26-d	4/21/93		20.9	0.6	60	6.5		
26-d	4/21/93		20.5	0.7	32	6.5		
26-d	4/22/93		20.0	0.7	64	6.0		
26-d	4/23/93	2:35	20.0	0.9	120	6.0		
26-d	4/24/93	7:48	20.0	0.8	80	7.5		

In situ Respiration Test Data - FE Warren AFB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump P (in Hg)	Temp (C)	Comments
27-s	4/19/93	15:25	19.0	2.5	200	8.0		
27-s	4/20/93		18.8	3.9	240	21.0		
27-s	4/20/93		17.5	5.5	300	9.0		
27-s	4/20/93		18.5	4.5	310	9.0		
27-s	4/21/93		18.5	3.5	320	8.0		
27-s	4/21/93		18.0	3.9	270	7.5		
27-s	4/22/93		17.0	4.3	300	9.0		
27-s	4/23/93	2:40	16.2	4.5	340	8.5		
27-s	4/24/93	7:51	16.5	4.0	290	8.0		
27-m	4/19/93	15:25	19.3	3.0	190	8.0		
27-m	4/20/93		18.0	3.5	210	21.1		
27-m	4/20/93		17.7	5.2	300	7.0		
27-m	4/20/93		18.0	4.3	310	7.0		
27-m	4/21/93		17.8	3.5	320	8.0	9.0	
27-m	4/21/93		16.7	4.1	290	6.0		
27-m	4/22/93		15.0	4.8	320	6.5	8.9	
27-m	4/23/93	2:40	13.8	5.2	380	6.0	8.5	
27-m	4/24/93	7:51	13.9	5.0	320	7.5	8.7	
27-d	4/19/93	15:25	20.0	1.3	100	8.0	8.6	
27-d	4/20/93		20.0	1.7	120	21.0	8.7	
27-d	4/20/93		19.0	2.8	200	7.0		
27-d	4/20/93		19.1	2.5	220	7.0		
27-d	4/21/93		18.3	2.5	260	10.0		
27-d	4/21/93		17.5	3.0	230	9.5		
27-d	4/22/93		16.0	3.9	270	7.5		
27-d	4/23/93	2:40	17.8	4.7	360	7.0		
27-d	4/24/93	7:51	13.1	4.8	320	7.5		
28-s	4/19/93	15:30	3.5	12.0	300	6.0		
28-s	4/20/93		10.0	10.0	360	20.0		
28-s	4/20/93		3.2	19.0	430	4.5		
28-m	4/19/93	15:30	2.5	12.0	300	7.0		
28-m	4/20/93		10.0	10.0	360	20.5		
28-m	4/20/93		3.0	18.0	430	5.5		
28-d	4/19/93	15:30	0.0	6.5	280	7.0	10.2	
28-d	4/20/93		12.0	6.0	340	21.0	10.3	
28-d	4/20/93		6.0	9.5	380	6.0		
29-s	4/19/93	15:35	6.0	5.0	220	7.0		
29-s	4/20/93		16.7	4.5	250	21.0		
29-s	4/20/93		13.0	7.2	340	5.0		
29-s	4/20/93		14.5	5.9	360	5.5		
29-s	4/21/93	14:30	14.0	4.8	400	8.5		
29-s	4/21/93		13.2	4.7	420			
29-s	4/22/93		12.3	5.5	330	5.5		
29-s	4/23/93		10.0	6.5	360	5.5		
29-s	4/24/93	14:44	14.5	6.0	400	6.5	10.1	
29-s	4/24/93	7:52	12.7	5.3	340	6.0	9.6	

## In situ Respiration Test Data - FE War AFB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
29-m	4/19/93	15:35	8.0	8.0	270	8.0		
29-m	4/20/93		7.5	11.0	300	20.0		
29-m	4/20/93		8.5	11.0	390	6.0		
29-m	4/20/93		10.3	8.8	400	7.0		
29-m	4/21/93	14:30	8.0	7.0	460	8.5	10.0	
29-m	4/21/93		6.5	7.3	350	7.0		
29-m	4/22/93		5.0	8.0	390	6.0		
29-m	4/23/93		2.0	10.0	420	7.5	10.5	
29-m	4/24/93	14:44	1.0					
29-d	4/19/93	15:35	12.0	3.8	200	6.0	10.1	
29-d	4/20/93		16.2	3.2	180	20.5	10.2	
29-d	4/20/93		10.5	5.5	320	6.0		
29-d	4/20/93		11.3	5.0	350	6.5		
29-d	4/21/93	14:30	6.0	6.0	460	7.0		
29-d	4/21/93		5.2	6.6	350	6.5		
29-d	4/22/93		3.5	7.7	390	6.0		

30-s	4/19/93	15:10	20.5	0.6	23	15.0		
30-s	4/20/93		20.9	0.7	20	20.4		
30-s	4/20/93		20.2	0.8	76	14.0		
30-s	4/20/93		20.5	0.6	90	16.0		
30-s	4/21/93		20.3	0.5	60	15.0		
30-s	4/21/93		20.5	0.6	20	13.0		
30-s	4/22/93		20.5	0.5	44	13.0		
30-s	4/23/93	14:27	20.5	0.7	40	13.5		
30-s	4/24/93	7:44	20.3	0.6	34	15.0		
30-m	4/19/93	15:10	19.5	0.5	20	17.0		
30-m	4/20/93		20.6	0.5	6	20.8		
30-m	4/20/93		20.0	0.6	60	18.0		
30-m	4/20/93		20.5	0.6	100	17.0		
30-m	4/21/93		20.7	0.5	79	17.0	7.4	
30-m	4/21/93		20.5	0.5	28	17.0		
30-m	4/22/93		20.2	0.6	68	18.0	7.2	
30-m	4/23/93	14:27	20.2	0.7	50	17.5	7.2	
30-m	4/24/93	7:44	20.6	0.5	26	17.0	8.0	
30-d	4/19/93	15:10	20.0	0.7	40	7.5	7.5	
30-d	4/20/93		20.0	0.5	11		7.6	
30-d	4/20/93		20.0	0.8	98	9.0		
30-d	4/20/93		20.3	0.7	100	8.0		
30-d	4/21/93		20.8	0.5	56	8.0		
30-d	4/21/93		20.0	0.7	48	7.0		
30-d	4/22/93		20.0	0.6	86	7.0		
30-d	4/23/93	14:27	20.0	0.7	74	6.5		
30-d	4/24/93	7:44	20.2	0.7	46	7.0		

## In situ Respiration Test Data - FE Warren FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
31-s	4/19/93	15:05	20.8	0.8	30	5.0		
31-s	4/20/93		20.5	0.8	60	21.0		
31-s	4/20/93		20.0	1.0	120	6.0		
31-s	4/20/93		20.5	0.8	100	6.5		
31-s	4/21/93		20.8	0.6	80	5.5		
31-s	4/21/93		20.2	0.7	42	5.0		
31-s	4/22/93		20.0	0.7	58	5.0		
31-s	4/23/93	14:24	20.3	0.7	69	6.0		
31-s	4/24/93	7:41	20.5	0.7	90	6.0		
31-m	4/19/93	15:05	16.5	0.7	22	10.0		
31-m	4/20/93		19.5	0.6	26	21.0		
31-m	4/20/93		19.5	0.8	100	13.5		
31-m	4/20/93		20.2	0.8	100	14.0		
31-m	4/21/93		20.5	0.6	70	12.0	7.9	
31-m	4/21/93		20.1	0.7	35	12.0		
31-m	4/22/93		20.0	0.7	66	13.0	7.6	
31-m	4/23/93	14:24	20.0	0.7	75	13.0	7.8	
31-m	4/24/93	7:41	20.5	0.6	60	13.0	8.1	
31-d	4/19/93	15:05	18.5	0.8	22	8.0	8.1	
31-d	4/20/93		19.8	0.6	14	21.0	8.1	
31-d	4/20/93		19.5	1.0	120	8.5		
31-d	4/20/93		20.1	0.8	100	8.5		
31-d	4/21/93		20.5	0.6	80	8.0		
31-d	4/21/93		20.1	0.8	58	7.5		
31-d	4/22/93		20.0	0.7	84	7.0		
31-d	4/23/93	14:24	19.9	0.8	100	8.0		
31-d	4/24/93	7:41	20.0	0.6	60	8.5		
32-s	4/19/93	15:00	8.5	4.7	70	20.0		
32-s	4/20/93		18.0	3.5	220	21.0		
32-s	4/20/93		17.2	4.0	260	20.0		
32-s	4/20/93		18.5	3.1	240	19.0		
32-s	4/21/93		18.0	2.8	300	20.0		
32-s	4/21/93		17.0	3.5	320	18.5		
32-s	4/22/93		17.0	3.7	300			
32-s	4/23/93		16.6	4.2	300	18.0		
32-s	4/24/93	7:31	17.0	3.7	300	18.0		
32-m	4/19/93	15:00	4.5	10.5	80	17.0		
32-m	4/20/93		9.0	10.2	380	21.0		
32-m	4/20/93		5.5	16.0	450	18.0		
32-m	4/20/93		8.5	12.5	470	17.5		
32-m	4/21/93		7.7	11.0	540	17.0	9.2	
32-m	4/21/93		6.7	11.0	530	17.0		
32-m	4/22/93		5.7	12.5	500	17.0	9.1	
32-m	4/23/93		5.7	12.2	480	17.0	8.9	
32-m	4/24/93	7:31	7.0	10.5	500	15.0	9.3	
32-d	4/19/93	15:00	0.0	14.0	1200	10.0	8.8	
32-d	4/20/93		4.8	8.0	100	21.0	8.8	

## In situ Respiration Test Data - FE Warr FB (4-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
33-s	4/19/93	14:30	10.5	8.5	120	6.0	9.4	
33-s	4/20/93		12.3	9.3	360	21.0		
33-s	4/20/93		11.0	11.0	400	5.5		
33-s	4/20/93		13.0	8.5	390	6.0		
33-s	4/21/93		14.5	7.3	440	5.0		
33-s	4/21/93		14.3	7.5	440	5.0		
33-s	4/22/93		14.1	7.5	420	5.0		
33-s	4/23/93	14:09	15.8	7.2	400	5.0		
33-s	4/24/93	7:37	16.0	6.3	370	6.5		
33-m	4/19/93	14:30	8.0	9.5	80	10.0		
33-m	4/20/93		9.8	11.2	370	20.5		
33-m	4/20/93		8.3	13.0	420	10.0		
33-m	4/20/93		11.0	10.0	410	10.0		
33-m	4/21/93		11.5	8.5	480	9.0	9.7	
33-m	4/21/93		11.3	9.0	470	9.0		
33-m	4/22/93		11.5	9.5	440	8.0	9.2	
33-m	4/23/93	14:09	12.7	9.5	450	9.0	8.9	
33-m	4/24/93	7:37	14.0	8.2	400	9.0	9.5	
33-d	4/19/93	14:30	3.5	2.5	440	12.0	9.3	
33-d	4/20/93		5.3	5.2	760	20.0	9.9	
33-d	4/21/93		2.5	9.3	1300	12.5		

34-s	4/19/93	14:15	16.5	4.0	200	7.0		
34-s	4/20/93	8:50	18.0	4.0	180	20.0		
34-s	4/20/93	11:25	17.5	4.3	260	5.5		Background Vac 2.0
34-s	4/20/93	14:15	17.8	9.9	250	5.0		
34-s	4/21/93	8:40	17.0	3.5	440	5.5		No diluter
34-s	4/21/93	17:00	16.7	3.7	330	5.5		Sensor change in meter
34-s	4/22/93	9:00	15.7	4.0	300	5.0		
34-s	4/23/93	14:05	15.0	4.5	300	5.0		
34-s	4/24/93	7:35	15.0	4.1	300	6.5		
34-m	4/19/93	14:15	17.0	4.0	220	8.0	10.0	
34-m	4/20/93	8:50	17.5	4.3	200	20.0		System shut off 8:25
34-m	4/20/93	11:25	16.7	4.7	290	6.5		
34-m	4/20/93	14:15	17.0	10.0	270	6.0		
34-m	4/21/93	8:40	16.0	3.7	460	6.0	10.0	No diluter
34-m	4/21/93	17:00	15.0	4.0	350	6.5		
34-m	4/22/93	9:00	14.0	4.5	340	6.5	9.3	
34-m	4/23/93	14:05	13.1	5.0	340	6.6	9.5	
34-m	4/24/93	7:35	13.3	3.8	340	7.5	10.2	
34-d	4/19/93	14:15	17.5	3.5	220	7.0		
34-d	4/20/93	8:50	17.0	3.7	170	20.0	10.3	
34-d	4/20/93	11:25	16.0	4.4	280	6.5		
34-d	4/20/93	14:15	16.3	9.9	270	6.5		
34-d	4/21/93	8:40	15.0	3.7	460	6.0		No diluter
34-d	4/21/93	17:00	14.3	4.2	360	6.5		
34-d	4/22/93	9:00	12.9	4.8	340	6.0		
34-d	4/23/93	14:05	12.0	5.5	350	6.0		
34-d	4/24/93	7:35	11.8	5.0	340	7.0		



In situ Respiration Test Data - FE Warren AFB (8-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
1-s	8/16/93	15:21	14.0	3.9	70			
1-s	8/16/93	20:42	12.5	6.4	90			
1-s	8/17/93	10:48	11.9	8.5	72			
1-s	8/17/93	17:15	11.5	7.8	72			
1-s	8/18/93	10:12	12.3	6.4	63			Italics indicate 1:1 dilution
1-s	8/19/93	11:51	10.4	8.1	67		22.4	
1-s	8/20/93	11:34	12.2	7.0	98		22.0	
1-s	8/27/93	12:31	14.5	5.7	65		23.5	
1-m	8/16/93	15:21	13.7	5.8	76			
1-m	8/16/93	20:42	5.5	11.0	80			
1-m	8/17/93	10:48	4.0	15.5	64			
1-m	8/17/93	17:15	3.3	14.5	75			Italics indicate 1:1 dilution
1-m	8/18/93	10:12	7.2	11.2	67			
1-m	8/19/93	11:51	6.0	13.5	69		19.9	
1-m	8/20/93	11:34	8.4	10.6	91		20.1	
1-m	8/27/93	12:31	11.9	7.7	69		21.8	
1-d	8/16/93	15:21	12.2	6.2	56			
1-d	8/16/93	20:42	3.4	11.8	76			
1-d	8/17/93	10:48	1.0	16.8	64			
1-d	8/17/93	17:15	0.0	15.9	76			

2-s	8/16/93	15:17	17.6	3.3	84			
2-s	8/16/93	20:39	14.8	5.1	90			
2-s	8/17/93	10:44	15.9	5.7	72			
2-s	8/17/93	17:13	15.2	5.1	74			
2-s	8/18/93	10:09	16.3	4.5	65			
2-s	8/19/93	11:48	15.8	4.8	66		22.4	
2-s	8/20/93	11:31	16.1	4.3	82		21.9	
2-s	8/27/93	12:25	17.7	3.4	66		23.4	
2-m	8/16/93	15:17	11.5	7.3	80			
2-m	8/16/93	20:39	10.0	8.2	85			
2-m	8/17/93	10:44	10.1	10.6	70			Italics indicate 1:1 dilution
2-m	8/17/93	17:13	9.5	9.7	81			
2-m	8/18/93	10:09	11.7	8.2	69			
2-m	8/19/93	11:48	10.8	9.2	68			Thermo-couple Broken
2-m	8/20/93	11:31	12.0	7.8	83			
2-m	8/27/93	12:25	14.1	6.1	63			
2-d	8/16/93	15:17	10.5	7.8	78			
2-d	8/16/93	20:39	7.0	9.6	84			
2-d	8/17/93	10:44	5.9	13.5	66			
2-d	8/17/93	17:13	5.3	12.5	80			Italics indicate 1:1 dilution
2-d	8/18/93	10:09	8.0	10.5	69			
2-d	8/19/93	11:48	7.0	12.5	69		17.0	
2-d	8/20/93	11:31	9.2	9.8	85		17.0	
2-d	8/27/93	12:25	12.0	7.5	68		19.0	

In situ Respiration Test Data - FE Warren A-B (8-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
3-s	8/16/93	15:13	16.0	4.0	76			
3-s	8/16/93	20:36	9.5	7.8	84			
3-s	8/17/93	10:41	7.3	10.6	100			
3-s	8/17/93	17:11	8.6	9.1	83			Italics indicate 1:1 dilution
3-s	8/18/93	10:06	9.5	8.3	68		23.7	
3-s	8/19/93	11:44	8.3	9.5	68		23.5	
3-s	8/20/93	11:28	9.8	7.8	82		25.2	
3-s	8/27/93	12:21	12.5	6.4	60			
3-m	8/16/93	15:13	13.0	5.5	80			
3-m	8/16/93	20:36	7.8	8.5	82			
3-m	8/17/93	10:41	6.1	12.0	110			
3-m	8/17/93	17:11	5.7	10.7	84			Italics indicate 1:1 dilution
3-m	8/18/93	10:06	8.0	9.4	70		20.5	
3-m	8/19/93	11:44	6.0	11.1	70		20.1	
3-m	8/20/93	11:28	8.1	9.1	84		22.0	
3-m	8/27/93	12:21	11.1	7.2	61			
3-d	8/16/93	15:13	14.0	4.3	80			
3-d	8/16/93	20:36	6.8	8.8	88			
3-d	8/17/93	10:41	5.4	12.3	105			
3-d	8/17/93	17:11	4.9	10.9	84			Italics indicate 1:1 dilution
3-d	8/18/93	10:06	7.7	9.5	70		16.9	
3-d	8/19/93	11:44	6.5	11.0	70		16.7	
3-d	8/20/93	11:28	8.6	9.0	85		18.7	
3-d	8/27/93	12:21	10.3	7.0	61			
4-s	8/16/93	15:02	21.0	0.3	70			
4-s	8/16/93	20:33	7.5	9.5	80			
4-s	8/17/93	10:38	6.6	12.6	100			
4-s	8/17/93	17:08	6.0	11.3	85			Italics indicate 1:1 dilution
4-s	8/18/93	16:03	7.0	10.0	70		18.5	
4-s	8/19/93	11:42	5.5	11.9	70		23.3	
4-s	8/20/93	11:26	7.0	11.0	80		24.6	
4-s	8/27/93	12:18	11.8	7.5	60			
4-m	8/16/93	15:02	14.0	3.9	64			
4-m	8/16/93	20:33	5.5	10.5	80			
4-m	8/17/93	10:38	3.0	14.8	100			
4-m	8/17/93	17:08	2.2	13.6	88			Italics indicate 1:1 dilution
4-m	8/18/93	16:03	4.5	12.0	74		23.7	
4-m	8/19/93	11:42	2.9	14.1	70		18.6	
4-m	8/20/93	11:26	4.6	12.0	83		19.9	
4-m	8/27/93	12:18	9.9	9.1	60			
4-d	8/16/93	15:02	14.0	3.8	68			
4-d	8/16/93	20:33	4.0	11.2	84			
4-d	8/17/93	10:38	1.3	16.0	100			Italics indicate 1:1 dilution
4-d	8/17/93	17:08	0.7	14.7	87			

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
5-s	8/16/93	14:52	19.2	1.9	64			
5-s	8/16/93	20:45	15.8	4.2	87			
5-s	8/17/93	10:35	15.9	5.0	92			
5-s	8/17/93	17:05	15.6	4.4	78			
5-s	8/18/93	9:58	14.8	4.5	68		23.2	
5-s	8/19/93	11:55	15.1	4.7	68		22.8	
5-s	8/20/93	11:20	15.0	4.3	77		23.3	
5-s	8/27/93	12:14	16.7	4.0	58			
5-m	8/16/93	14:52	15.5	4.0	60			
5-m	8/16/93	20:45	10.0	6.0	85			
5-m	8/17/93	10:35	5.0	13.0	85			
5-m	8/17/93	17:05	4.5	12.0	87			Fitting to be replaced
5-m	8/18/93	9:58	6.2	10.6	71		22.1	Italics indicate 1:1 dilution
5-m	8/19/93	11:55	5.8	12.0	71		21.7	
5-m	8/20/93	11:20	8.0	10.0	80		22.8	
5-m	8/27/93	12:14	11.0	8.1	60			
5-d	8/16/93	14:52	14.5	4.5	73			
5-d	8/16/93	20:45	4.0	11.2	80			
5-d	8/17/93	10:35	0.7	16.4	87			
5-d	8/17/93	17:05	0.0	15.2	86			Italics indicate 1:1 dilution
5-d	8/18/93	9:58	2.2	13.5	70			

6-s	8/16/93	14:47	16.5	4.2	88			
6-s	8/16/93	20:49	16.5	3.8	100			
6-s	8/17/93	10:32	15.0	5.3	84			
6-s	8/17/93	17:02	14.4	4.8	87			
6-s	8/18/93	9:55	13.6	5.0	78		22.7	Italics indicate 1:1 dilution
6-s	8/19/93	11:58	12.0	5.9	67		22.6	
6-s	8/20/93	11:37	12.6	5.3	74		23.7	
6-s	8/27/93	12:35	14.1	5.2	71			
6-m	8/16/93	14:47	18.5	2.2	87			
6-m	8/16/93	20:49	14.7	4.6	100			
6-m	8/17/93	10:32	11.2	7.4	92			
6-m	8/17/93	17:02	10.6	7.0	84			Italics indicate 1:1 dilution
6-m	8/18/93	9:55	9.1	7.3	74		18.7	
6-m	8/19/93	11:58	10.0	7.6	72		18.6	
6-m	8/20/93	11:37	8.0	6.8	81		20.5	
6-m	8/27/93	12:35	11.8	6.9	71			
6-d	8/16/93	14:47	17.0	3.5	94			
6-d	8/16/93	20:49	13.1	5.2	100			
6-d	8/17/93	10:32	9.6	8.2	82			
6-d	8/17/93	17:02	8.8	7.9	87			Italics indicate 1:1 dilution
6-d	8/18/93	9:55	8.5	8.2	75		21.7	
6-d	8/19/93	11:58	7.3	8.9	73		21.7	
6-d	8/20/93	11:37	7.8	8.4	80		23.2	
6-d	8/27/93	12:35	10.5	7.5	72			

In situ Respiration Test Data - FE Warren Area (8-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
7-s	8/16/93	14:42	18.6	2.6	82			
7-s	8/16/93	17:52	17.5	3.3	80			
7-s	8/16/93	19:26	16.3	4.0	80			
7-s	8/17/93	10:28	17.7	3.8	68			
7-s	8/17/93	10:58	17.3	3.4	77			
7-s	8/18/93	11:30	17.8	3.0	56			Replaced Fitting
7-s	8/19/93	12:00	16.7	3.8	67			
7-s	8/20/93	11:41	17.0	3.3	71			
7-s	8/27/93	12:38	17.8	2.9	67			
7-m	8/16/93	14:42	18.6	2.3	80			
7-m	8/16/93	17:52	17.8	2.7	80			
7-m	8/16/93	19:26	16.5	3.7	80			
7-m	8/17/93	10:28	17.3	3.7	68			
7-m	8/17/93	10:58	17.9	3.4	68			Italics indicate 1:1 dilution
7-m	8/18/93	11:30	17.8	3.1	58			
7-m	8/19/93	12:00	16.5	3.6	67		19.8	Cloudy day, cool
7-m	8/20/93	11:41	16.5	3.3	72		20.1	
7-m	8/27/93	12:38	17.1	3.1	67		21.2	
7-d	8/16/93	14:42	19.0	2.0	84			
7-d	8/16/93	17:52	18.5	2.1	75			
7-d	8/16/93	19:26	17.0	3.1	80			
7-d	8/17/93	10:28	17.6	3.2	69			
7-d	8/17/93	10:58	17.1	2.9	77			
7-d	8/18/93	11:30	18.0	2.7	54			Replace fitting
7-d	8/19/93	12:00	16.5	3.2	66			Rained last night
7-d	8/20/93	11:41	16.8	2.9	70			
7-d	8/27/93	12:38	16.9	3.0	67			
8-s	8/16/93	14:37	19.8	2.8	130			
8-s	8/16/93	20:53	18.0	3.5	92			
8-s	8/17/93	12:37	16.5	4.5	86			
8-s	8/18/93	11:34	17.1	3.7	58			
8-s	8/19/93	12:04	15.2	4.8	67			
8-s	8/20/93	11:44	15.2	4.3	70			
8-s	8/27/93	12:42	16.2	3.7	64			
8-m	8/16/93	14:37	18.3	2.8	120			
8-m	8/16/93	20:53	17.8	3.0	88			
8-m	8/17/93	12:37	16.1	4.2	82			
8-m	8/18/93	11:34	17.2	3.3	58			
8-m	8/19/93	12:04	14.9	4.5	68		21.4	
8-m	8/20/93	11:44	15.0	4.0	70		21.1	
8-m	8/27/93	12:42	15.3	3.9	65		22.5	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
8-d	8/16/93	14:37	19.5	1.8	130			
8-d	8/16/93	20:53	18.3	2.2	82			
8-d	8/17/93	12:37	16.7	3.5	85			
8-d	8/18/93	11:34	17.4	2.9	57			
8-d	8/19/93	12:04	15.0	3.9	66			
8-d	8/20/93	11:44	15.0	3.7	70			
8-d	8/27/93	12:42	14.9	3.8	64	0.2		
9-s	8/16/93	14:33	20.2	0.8	110			
9-s	8/16/93	20:57	19.2	1.7	72			
9-s	8/17/93	12:39	19.1	2.3	59			Couple to be replaced
9-s	8/18/93	11:37	19.3	1.8	48			
9-s	8/19/93	12:06	18.5	2.1	56			
9-s	8/20/93	11:46	18.7	1.7	60			
9-s	8/27/93	12:46	18.8	1.6	58			
9-m	8/16/93	14:33	20.3	0.8	96			
9-m	8/16/93	20:57	20.0	1.0	54			
9-m	8/17/93	12:39	19.1	1.2	45			
9-m	8/18/93	11:37	19.4	1.1	38			
9-m	8/19/93	12:06	18.2	1.2	45		19.7	
9-m	8/20/93	11:46	18.4	1.1	49		20.4	
9-m	8/27/93	12:46	17.9	1.3	54		21.4	
9-d	8/16/93	14:33	20.4	0.7	100			
9-d	8/16/93	20:57	20.2	0.8	44			
9-d	8/17/93	12:39	19.5	0.8	39			Couple to be replaced
9-d	8/18/93	11:37	19.6	0.8	28			
9-d	8/19/93	12:06	18.6	0.9	35			
9-d	8/20/93	11:46	19.0	0.8	36			
9-d	8/27/93	12:46	18.0	1.1	49			
10-s	8/16/93	14:00	16.3	4.4	86			
10-s	8/16/93	20:30	15.0	5.5	88			
10-s	8/17/93	12:33	15.5	5.8	41			
10-s	8/18/93	11:24	15.7	4.7	61			
10-s	8/19/93	11:37	14.6	5.5	68			
10-s	8/20/93	11:15	14.8	4.9	82			
10-s	8/27/93	12:10	15.4	4.9	58			
10-m	8/16/93	14:00	16.0	4.7	86			
10-m	8/16/93	20:30	14.8	5.0	90			
10-m	8/17/93	12:33	14.1	6.0	92			
10-m	8/18/93	11:24	14.4	5.2	64			Italics indicate 1:1 dilution
10-m	8/19/93	11:37	12.7	6.2	64		20.2	
10-m	8/20/93	11:15	12.8	5.8	79		19.4	
10-m	8/27/93	12:10	13.2	6.2	56		20.9	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
10-d	8/16/93	14:00	17.6	2.7	84			
10-d	8/16/93	20:30	15.5	3.8	88			
10-d	8/17/93	12:33	13.9	4.9	92			
10-d	8/18/93	11:24	13.8	4.8	62			
10-d	8/19/93	11:37	11.6	6.2	63			Italics indicate 1:1 dilution
10-d	8/20/93	11:15	11.8	6.0	78			
10-d	8/27/93	12:10	12.0	6.8	60			

11-s	8/16/93	14:06	10.1	7.3	82			
11-s	8/16/93	17:43	8.2	7.9	100			
11-s	8/16/93	19:21	4.5	10.5	70			
11-s	8/16/93	19:58	6.8	9.5	87			
11-s	8/17/93	10:23	10.1	9.4	71			
11-s	8/17/93	16:55	10.5	8.2	87			Italics indicate 1:1 dilution
11-s	8/18/93	9:52	12.5	4.8	67			
11-s	8/19/93	11:35	9.2	6.8	60			
11-s	8/20/93	11:13	9.5	6.8	80			
11-s	8/27/93	12:08	12.7	6.2	60			

11-m	8/16/93	14:06	8.5	8.8	72			
11-m	8/16/93	17:43	4.8	10.8	100			
11-m	8/16/93	19:21	0.0	15.3	60			
11-m	8/16/93	19:58	2.1	14.0	82			
11-m	8/17/93	10:23	2.5	15.0	64			
11-m	8/17/93	16:55	1.2	14.0	92			Italics indicate 1:1 dilution
11-m	8/18/93	9:52	2.2	14.0	80		21.5	
11-m	8/19/93	11:35	1.3	15.2	64			

11-d	8/16/93	14:06	2.2	9.5	65			
11-d	8/16/93	17:43	0.0	10.0	72			
11-d	8/16/93	19:58	2.2	9.0				
11-d	8/17/93	10:23	0.0	13.1	44			
11-d	8/17/93	16:55	0.0	11.9	93			Italics indicate 1:1 dilution
11-d	8/18/93	9:52	0.8	12.0	86			

12-s	8/16/93	14:11	17.3	3.4	74			
12-s	8/16/93	20:27	17.5	3.2	86			
12-s	8/17/93	12:31	17.0	3.9	76			
12-s	8/18/93	11:21	17.0	3.3	60			
12-s	8/19/93	11:32	15.5	3.7	56			
12-s	8/20/93	11:09	15.5	3.3	78			Italics indicate 1:1 dilution
12-s	8/27/93	12:03	12.5	4.1	54			

12-m	8/16/93	14:11	18.0	2.8	74			
12-m	8/16/93	20:27	17.0	3.3	86			
12-m	8/17/93	12:31	16.1	4.0	75			
12-m	8/18/93	11:21	15.8	3.9	63			
12-m	8/19/93	11:32	14.2	4.2	59		22.0	
12-m	8/20/93	11:09	14.3	3.9	76		21.1	Italics indicate 1:1 dilution
12-m	8/27/93	12:03	11.2	4.6	56		22.3	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
12-d	8/16/93	14:11	18.0	2.6	73			
12-d	8/16/93	20:27	17.5	2.8	84			
12-d	8/17/93	12:31	15.5	3.8	75			
12-d	8/18/93	11:21	15.0	3.8	60			
12-d	8/19/93	11:32	13.4	4.3	58			
12-d	8/20/93	11:09	13.4	4.2	77			Italics indicate 1:1 dilution
12-d	8/27/93	12:03	10.0	5.3	58			
13-s	8/16/93	14:15	15.5	6.5	71			
13-s	8/16/93	20:25	12.8	7.1	86			
13-s	8/17/93	12:28	9.5	9.8	85			Italics indicate 1:1 dilution
13-s	8/18/93	11:16	8.2	8.8	67			
13-s	8/19/93	11:28	4.8	11.3	66			
13-s	8/20/93	11:06	5.3	10.2	83			
13-s	8/27/93	11:59	7.7	8.2	62			
13-m	8/16/93	14:15	14.0	4.5	75			
13-m	8/16/93	20:25	14.0	5.8	90			
13-m	8/17/93	12:28	10.0	8.3	82			Italics indicate 1:1 dilution
13-m	8/18/93	11:16	9.0	7.8	67			
13-m	8/19/93	11:28	5.6	9.3	65		23.2	
13-m	8/20/93	11:06	5.8	8.5	83		22.4	
13-m	8/27/93	11:59	7.1	7.7	62		23.3	
13-d	8/16/93	14:15	18.5	2.6	69			
13-d	8/16/93	20:25	18.2	2.3	76			
13-d	8/17/93	12:28	15.2	3.0	72			
13-d	8/18/93	11:16	13.0	2.2	60			
13-d	8/19/93	11:28	9.5	3.6	47			Fitting to be replaced
13-d	8/20/93	11:06	8.5	3.7	64			Italics indicate 1:1 dilution
13-d	8/27/93	11:59	7.0	6.0	59			
14-s	8/16/93	14:22	18.2	3.2	70			
14-s	8/16/93	20:22	18.2	2.8	86			
14-s	8/17/93	12:24	17.6	3.3	72			
14-s	8/18/93	11:14	17.3	3.4	62			
14-s	8/19/93	11:26	16.4	3.5	60			
14-s	8/20/93	11:04	16.6	3.4	76			
14-s	8/27/93	11:57	15.8	3.5	60			
14-m	8/16/93	14:22	18.5	2.9	71			
14-m	8/16/93	20:22	18.0	2.8	86			
14-m	8/17/93	12:24	16.7	3.6	73			
14-m	8/18/93	11:14	16.4	3.7	68			
14-m	8/19/93	11:26	15.1	3.9	62		19.6	
14-m	8/20/93	11:04	15.2	3.8	79		19.5	
14-m	8/27/93	11:57	14.5	4.0	61		20.8	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
14-d	8/16/93	14:22	18.9	2.4	95			
14-d	8/16/93	20:22	18.3	2.5	85			
14-d	8/17/93	12:24	17.0	3.0	75			
14-d	8/18/93	11:14	16.5	3.4	60			
14-d	8/19/93	11:26	14.9	3.7	62			
14-d	8/20/93	11:04	14.8	3.7	79			
14-d	8/27/93	11:57	13.4	4.1	60			

15-s	8/16/93	13:56	18.2	2.2	78			
15-s	8/16/93	20:09	18.8	2.3	80			
15-s	8/17/93	12:09	19.1	2.3	63			
15-s	8/18/93	10:51	19.2	2.1	50			
15-s	8/19/93	11:12	18.8	2.3	55			
15-s	8/20/93	10:48	18.2	2.1	65			
15-s	8/27/93	11:40	18.1	2.2	58			
15-m	8/16/93	13:56	19.0	2.2	80			
15-m	8/16/93	20:09	18.5	2.4	80			
15-m	8/17/93	12:09	18.5	2.6	66			
15-m	8/18/93	10:51	18.8	2.4	54			
15-m	8/19/93	11:12	18.0	2.8	59		18.0	
15-m	8/20/93	10:48	17.6	2.5	70		18.0	
15-m	8/27/93	11:40	17.0	2.9	62		19.1	
15-d	8/16/93	13:56	20.0	1.2	65			
15-d	8/16/93	20:09	19.4	1.3	65			
15-d	8/17/93	12:09	18.9	1.7	58			
15-d	8/18/93	10:51	19.0	1.8	48			
15-d	8/19/93	11:12	18.2	2.2	54			
15-d	8/20/93	10:48	17.8	2.0	64			
15-d	8/27/93	11:40	16.6	2.7	61			

16-s	8/16/93	13:52	18.8	2.3	73			
16-s	8/16/93	20:12	18.2	0.0	82			
16-s	8/17/93	12:11	18.3	2.9	65			
16-s	8/18/93	10:55	18.2	2.8	58			
16-s	8/19/93	11:14	17.1	3.2	62			
16-s	8/20/93	10:51	17.0	3.0	73			
16-s	8/27/93	11:43	16.2	3.5	64			
16-m	8/16/93	13:52	19.5	1.4	66			
16-m	8/16/93	20:12	19.2	1.7	70			
16-m	8/17/93	12:11	18.4	1.9	59			
16-m	8/18/93	10:55	18.2	1.1	52			
16-m	8/19/93	11:14	17.2	2.5	57		17.7	
16-m	8/20/93	10:51	17.0	2.3	69		17.6	
16-m	8/27/93	11:43	15.1	3.5	64		18.6	



Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
16-d	8/16/93	13:52	20.2	0.8	50			
16-d	8/16/93	20:12	19.8	0.9	54			
16-d	8/17/93	12:11	19.2	1.0	48			
16-d	8/18/93	10:55	18.8	1.3	42			
16-d	8/19/93	11:14	17.7	1.8	47			
16-d	8/20/93	10:51	17.5	1.8	60			
16-d	8/27/93	11:43	15.1	3.0	62			

17-s	8/16/93	13:45	15.0	5.2	87			
17-s	8/16/93	19:38	14.2	5.7	80			
17-s	8/17/93	12:14	14.8	5.8	69			
17-s	8/18/93	10:57	15.0	5.2	69			Replaced fitting
17-s	8/19/93	11:17	13.2	6.1	71			
17-s	8/20/93	10:53	13.3	5.7	85			Italics indicate 1:1 dilution
17-s	8/27/93	11:46	12.7	6.2	64			
17-m	8/16/93	13:45	15.5	4.8	85			
17-m	8/16/93	19:38	15.5	3.8	80			
17-m	8/17/93	12:14	15.2	4.3	68			
17-m	8/18/93	10:57	15.2	4.5	70			
17-m	8/19/93	11:17	13.3	5.1	71		20.0	
17-m	8/20/93	10:53	13.3	5.0	86		20.0	Italics indicate 1:1 dilution
17-m	8/27/93	11:46	12.2	6.3	64		21.3	
17-d	8/16/93	13:45	18.3	2.0	78			
17-d	8/16/93	19:38	17.3	2.3	67			
17-d	8/17/93	12:14	16.9	2.7	61			
17-d	8/18/93	10:57	16.4	3.2	61			
17-d	8/19/93	11:17	14.4	3.9	66			
17-d	8/20/93	10:53	14.0	4.0	82			Italics indicate 1:1 dilution
17-d	8/27/93	11:46	11.9	6.1	64			

18-s	8/16/93	13:39	13.0	7.2	46			
18-s	8/16/93	19:35	8.0	10.5	85			
18-s	8/16/93	20:15	11.2	8.1	110			
18-s	8/17/93	12:16	9.3	10.7	75			Italics indicate 1:1 dilution
18-s	8/18/93	11:00	9.0	10.1	72			
18-s	8/19/93	11:20	7.1	11.1	73			
18-s	8/20/93	10:57	7.2	10.2	88			
18-s	8/27/93	11:50	8.9	9.6	70			
18-m	8/16/93	13:39	14.5	5.6	100			
18-m	8/16/93	19:35	10.0	8.0	93			
18-m	8/16/93	20:15	12.4	6.8	110			
18-m	8/17/93	12:16	9.0	9.2	74			Italics indicate 1:1 dilution
18-m	8/18/93	11:00	9.2	8.5	72			
18-m	8/19/93	11:20	6.0	10.9	74		23.4	
18-m	8/20/93	10:57	6.4	10.0	90		23.5	
18-m	8/27/93	11:50	7.2	10.4	71		24.2	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
18-d	8/16/93	13:39	17.8	2.9	98			Italics indicate 1:1 dilution
18-d	8/16/93	19:35	14.9	3.8	86			
18-d	8/16/93	20:15	18.7	3.6	100			
18-d	8/17/93	12:16	12.0	4.9	63			
18-d	8/18/93	11:00	11.2	5.3	64			
18-d	8/19/93	11:20	7.1	7.2	68			
18-d	8/20/93	10:57	7.2	7.5	85			
18-d	8/27/93	11:50	7.0	9.8	70			
19-s	8/16/93	13:35	17.0	4.0	90			Couple to be replaced  Italics indicate 1:1 dilution
19-s	8/16/93	20:19	16.3	4.2	100			
19-s	8/17/93	12:20	14.5	4.9	125			
19-s	8/18/93	11:02	14.0	4.8	72			
19-s	8/19/93	11:23	11.0	5.8	58			
19-s	8/20/93	11:00	11.0	5.5	75			
19-s	8/27/93	11:54	9.1	6.9	64			
19-m	8/16/93	13:35	19.0	2.2	80			Replace fitting  Italics indicate 1:1 dilution
19-m	8/16/93	20:19	17.8	2.6	90			
19-m	8/17/93	12:20	15.2	3.3	125			
19-m	8/18/93	11:02	14.0	3.9	70			
19-m	8/19/93	11:23	10.9	4.8	54		20.8	
19-m	8/20/93	11:00	10.5	4.8	72		20.4	
19-m	8/27/93	11:54	8.2	6.7	64		21.9	
19-d	8/16/93	13:35	19.8	1.0	65			Italics indicate 1:1 dilution
19-d	8/16/93	20:19	19.3	1.2	63			
19-d	8/17/93	12:20	17.3	1.7	110			
19-d	8/18/93	11:02	16.0	2.4	60			
19-d	8/19/93	11:23	12.9	3.2	44			
19-d	8/20/93	11:00	12.0	3.5	62			
19-d	8/27/93	11:54	8.9	5.8	62			

20-s	8/16/93	12:46	20.0	1.0	60			
20-s	8/16/93	20:06	20.0	1.2	58			
20-s	8/17/93	12:07	19.0	1.0	48			
20-s	8/18/93	10:48	20.0	1.0	34			
20-s	8/19/93	11:09	19.9	1.0	38			
20-s	8/20/93	10:45	19.2	1.0	45			
20-s	8/27/93	11:37	19.5	1.1	46			
20-m	8/16/93	12:46	19.0	0.8	46			
20-m	8/16/93	20:06	20.0	0.8	41			
20-m	8/17/93	12:07	19.0	0.8	37			
20-m	8/18/93	10:48	20.0	0.8	25			
20-m	8/19/93	11:09	19.6	0.8	29		16.6	
20-m	8/20/93	10:45	19.0	0.8	37		16.8	
20-m	8/27/93	11:37	18.8	1.0	44	0.3	17.9	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
20-d	8/16/93	12:46	20.5	0.5	30			
20-d	8/16/93	20:06	20.5	0.6	20			
20-d	8/17/93	12:07	20.5	0.5	25			
20-d	8/18/93	10:48	20.3	0.7	12			
20-d	8/19/93	11:09	19.8	0.6	14			
20-d	8/20/93	10:45	19.2	0.6	20			
20-d	8/27/93	11:37	18.2	0.9	41			

21-s	8/16/93	12:42	19.5	1.3	60			Couple to be changed
21-s	8/16/93	20:02	19.2	1.7	60			
21-s	8/17/93	12:04	19.5	1.5	76			
21-s	8/18/93	10:45	19.8	1.2	41			
21-s	8/19/93	11:06	19.3	1.4	44			
21-s	8/20/93	10:42	18.8	1.2	52			
21-s	8/27/93	11:34	19.2	1.3	50			
21-m	8/16/93	12:42	20.2	0.7	54			
21-m	8/16/93	20:02	19.6	1.0	50			
21-m	8/17/93	12:04	19.7	0.9	66			
21-m	8/18/93	10:45	19.8	0.9	34			
21-m	8/19/93	11:06	19.2	0.9	36		17.5	
21-m	8/20/93	10:42	18.7	0.9	44		17.8	
21-m	8/27/93	11:34	18.6	1.1	46	0.4	19.0	
21-d	8/16/93	12:42	20.2	0.6	30			
21-d	8/16/93	20:02	20.4	0.7	25			
21-d	8/17/93	12:04	20.1	0.5	56			
21-d	8/18/93	10:45	20.4	0.7	17			
21-d	8/19/93	11:06	19.9	0.6	15			
21-d	8/20/93	10:42	19.2	0.6	22			
21-d	8/27/93	11:34	18.1	0.9	37			

22-s	8/16/93	12:35	16.3	3.8	78			
22-s	8/16/93	19:43	15.7	4.0	78			
22-s	8/17/93	12:02	17.0	4.2	78			
22-s	8/18/93	10:45	17.2	3.1	74			
22-s	8/19/93	11:04	16.3	4.0	66			
22-s	8/20/93	10:39	15.8	3.6	77			
22-s	8/27/93	11:31	15.7	3.6	63			
22-m	8/16/93	12:35	19.6	1.8	60			
22-m	8/16/93	19:43	18.2	1.8	60			
22-m	8/17/93	12:02	17.9	2.2	67			
22-m	8/18/93	10:45	17.7	1.8	67			
22-m	8/19/93	11:04	16.2	2.9	58		17.8	
22-m	8/20/93	10:39	15.8	2.7	70		17.6	
22-m	8/27/93	11:31	14.2	3.4	61		18.9	

Sampling Point	Date	Time	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
22-d	8/16/93	12:35	20.0	0.8	30			
22-d	8/16/93	19:43	19.9	0.8	28			
22-d	8/17/93	12:02	19.2	0.8	47			
22-d	8/18/93	10:45	18.8	0.8	45			
22-d	8/19/93	11:04	17.7	1.2	40			
22-d	8/20/93	10:39	16.8	1.3	53			
22-d	8/27/93	11:31	14.2	2.9	57			
23-s	8/16/93	12:31	18.0	2.9	65			
23-s	8/16/93	19:31	18.0	3.0	74			
23-s	8/17/93	12:00	18.5	2.3	62			
23-s	8/18/93	10:39	18.1	2.0	64			
23-s	8/19/93	11:01	17.3	2.8	58			
23-s	8/20/93	10:37	16.3	2.7	70			
23-s	8/27/93	11:27	14.7	3.5	68			
23-m	8/16/93	12:31	19.5	1.2	54			
23-m	8/16/93	19:31	19.0	1.5	56			
23-m	8/17/93	12:00	19.0	1.4	58			
23-m	8/18/93	10:39	18.5	0.9	53			
23-m	8/19/93	11:01	17.0	1.6	43		19.3	
23-m	8/20/93	10:37	15.6	1.5	52		19.0	
23-m	8/27/93	11:27	12.0	2.8	53	0.8	20.5	
23-d	8/16/93	12:31	20.2	0.7	30			
23-d	8/16/93	19:31	20.0	0.7	36			
23-d	8/17/93	12:00	19.0	0.8	44			
23-d	8/18/93	10:39	18.0	0.7	43			
23-d	8/19/93	11:01	16.0	1.2	40			
23-d	8/20/93	10:37	14.5	1.7	55			
23-d	8/27/93	11:27	10.4	4.0	68			
24-s	8/16/93	12:26	16.5	4.2	82			
24-s	8/16/93	19:16	14.0	5.8	140			
24-s	8/17/93	11:58	15.4	5.2	79			
24-s	8/18/93	10:35	15.0	4.4	78			
24-s	8/19/93	10:57	12.8	5.8	66			Italics indicate 1:1 dilution
24-s	8/20/93	10:34	11.7	5.0	76			
24-s	8/27/93	11:24	12.6	5.1	64			
24-m	8/16/93	12:26	17.5	3.3	77			
24-m	8/16/93	19:16	16.2	3.9	130			
24-m	8/17/93	11:58	16.5	3.6	75			
24-m	8/18/93	10:35	15.0	3.5	76			
24-m	8/19/93	10:57	12.0	4.7	60		18.7	Italics indicate 1:1 dilution
24-m	8/20/93	10:34	10.9	4.6	73		18.5	
24-m	8/27/93	11:24	9.3	5.9	66		20.2	

In situ Respiration Test Data - FE Warren AFB (8-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
24-d	8/16/93	12:26	19.5	1.0	51			
24-d	8/16/93	19:16	18.8	1.7				
24-d	8/17/93	11:58	17.9	2.0	63			
24-d	8/18/93	10:35	16.2	2.2	67			
24-d	8/19/93	10:57	13.0	3.6	52			Italics indicate 1:1 dilution
24-d	8/20/93	10:34	11.5	3.8	64			
24-d	8/27/93	11:24	9.0	5.6	65			

25-s	8/16/93	11:53	19.2	2.0	73			
25-s	8/16/93	18:40	19.8	1.4	76			
25-s	8/17/93	11:51	18.2	1.4	71			
25-s	8/18/93	10:26	19.4	1.6	55			
25-s	8/19/93	10:42	19.0	2.2	57			
25-s	8/20/93	9:41	18.9	2.5	69			
25-s	8/27/93	11:06	19.1	2.0	49			
25-m	8/16/93	11:53	20.6	0.7	50			
25-m	8/16/93	18:40	20.8	0.5	52			
25-m	8/17/93	11:51	20.0	0.8	50			
25-m	8/18/93	10:26	20.0	0.7	33			
25-m	8/19/93	10:42	19.6	0.8	33		15.7	
25-m	8/20/93	9:41	19.6	0.9	40		14.6	
25-m	8/27/93	11:06	19.5	0.7	1	5.4	16.9	
25-d	8/16/93	11:53	20.8	0.6	26			
25-d	8/16/93	18:40	20.8	0.6	20			
25-d	8/17/93	11:51	20.7	0.6	31			
25-d	8/18/93	10:26	20.5	0.5	12			
25-d	8/19/93	10:42	20.1	0.6	14			
25-d	8/20/93	9:41	20.1	0.7	18			
25-d	8/27/93	11:06	19.5	0.7	14			

26-s	8/16/93	11:56	20.0	0.9	120			
26-s	8/16/93	18:43	20.2	0.8	40			
26-s	8/17/93	11:54	20.0	1.1	57			
26-s	8/18/93	10:29	19.8	0.8	54			
26-s	8/19/93	10:45	19.4	1.3	45			
26-s	8/20/93	9:49	19.2	1.3	52			
26-s	8/27/93	11:10	19.2	1.4	41			
26-m	8/16/93	11:56	20.5	0.7	40			
26-m	8/16/93	18:43	20.5	0.7	30			
26-m	8/17/93	11:54	20.2	0.8	39			
26-m	8/18/93	10:29	20.0	0.6	35			
26-m	8/19/93	10:45	19.5	0.8	23		16.4	
26-m	8/20/93	9:49	19.2	0.7	28		15.8	
26-m	8/27/93	11:10	18.8	1.0	30		17.8	

Sampling Point	Date	Time	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
26-d	8/16/93	11:56	20.5	0.7	26			
26-d	8/16/93	18:43	20.8	0.6	20			
26-d	8/17/93	11:54	20.5	0.7	37			
26-d	8/18/93	10:29	20.2	0.6	36			
26-d	8/19/93	10:45	19.7	0.7	21			
26-d	8/20/93	9:49	19.2	0.7	26			
26-d	8/27/93	11:10	18.6	1.0	33			

27-s	8/16/93	11:59	9.4	5.0	120			
27-s	8/16/93	19:06	9.2	8.5	120			
27-s	8/17/93	11:56	13.0	7.5	76			
27-s	8/18/93	10:32	13.5	5.5	83			
27-s	8/19/93	10:48	11.4	6.7	66			Italics indicate 1:1 dilution
27-s	8/20/93	10:00	11.0	6.2	72			
27-s	8/27/93	11:14	12.4	6.2	61			
27-m	8/16/93	11:59	15.2	4.4	120			
27-m	8/16/93	19:06	10.5	6.8	120			
27-m	8/17/93	11:56	10.4	6.8	76			
27-m	8/18/93	10:32	9.8	6.0	78			Italics indicate 1:1 dilution
27-m	8/19/93	10:48	6.8	7.9	68		19.2	
27-m	8/20/93	10:00	5.2	8.7	78		18.6	
27-m	8/27/93	11:14	8.0	8.7	68		20.3	
27-d	8/16/93	11:59	13.2	1.9	110			
27-d	8/16/93	19:06	15.3	3.2	110			
27-d	8/17/93	11:56	12.6	4.5	76			
27-d	8/18/93	10:32	10.8	4.8	74			Italics indicate 1:1 dilution
27-d	8/19/93	10:48	7.7	7.0	67			
27-d	8/20/93	10:00	6.0	7.6	77			
27-d	8/27/93	11:14	7.4	8.9	68			

28-s	8/16/93	12:10	6.0	9.8	80			
28-s	8/16/93	19:10	0.0	16.8	110			
28-s	8/16/93	19:54	1.8	13.0				
28-s	8/17/93	10:19	6.9	13.7	87			
28-s	8/17/93	16:50	6.9	11.5	95			Italics indicate 1:1 dilution
28-s	8/18/93	9:44	7.5	11.2	68			
28-s	8/19/93	10:51	6.6	12.6	74			
28-s	8/20/93	10:15	4.5	12.2				
28-s	8/27/93	11:18	11.4	7.9	68			
28-m	8/16/93	12:10	6.5	10.5	70			
28-m	8/16/93	19:10	0.0	19.0	100			
28-m	8/16/93	19:54	0.0	13.9				
28-m	8/17/93	10:19	1.2	16.3	80			
28-m	8/17/93	16:50	1.1	14.4	96			Italics indicate 1:1 dilution
28-m	8/18/93	9:44	3.2	14.0	70			
28-m	8/19/93	10:51	1.3	16.3	72		20.8	

In situ Respiration Test Data - FE Warren AFB (8-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
28-d	8/16/93	12:10	7.0	7.0	74			
28-d	8/16/93	19:10	0.0	19.5	110			
28-d	8/16/93	19:54	0.0	9.0				
28-d	8/17/93	10:19	0.0	11.1	86			Italics indicate 1:1 dilution
28-d	8/17/93	16:50	0.0	10.0	91			
29-s	8/16/93	12:16	12.2	6.8	50			
29-s	8/16/93	17:34	12.0	6.0	88			
29-s	8/16/93	19:13	5.8	10.5				
29-s	8/16/93	19:48	9.5	7.7	82			
29-s	8/17/93	10:15	9.2	9.9	91			
29-s	8/17/93	16:47	8.6	9.3	110			Italics indicate 1:1 dilution
29-s	8/18/93	9:47	7.5	9.3	60			
29-s	8/19/93	10:54	4.8	10.8	71			
29-s	8/20/93	10:32	4.0	10.2	85			
29-s	8/27/93	11:21	8.5	8.5	80			
29-m	8/16/93	12:16	11.0	7.0	85			
29-m	8/16/93	17:34	9.6	7.0	90			
29-m	8/16/93	19:13	2.2	11.8	110			
29-m	8/16/93	19:48	7.1	8.5	83			
29-m	8/17/93	10:15	4.6	10.9	92			
29-m	8/17/93	16:47	3.7	10.2	110			Italics indicate 1:1 dilution
29-m	8/18/93	9:47	2.8	10.5	62			
29-m	8/19/93	10:54	0.8	12.4	71		21.5	
29-d	8/16/93	12:16	17.0	2.0	48			
29-d	8/16/93	17:34	16.5	1.8	98			
29-d	8/16/93	19:13	11.0	3.8				
29-d	8/16/93	19:48	12.7	3.3	90			
29-d	8/17/93	10:15	4.0	7.8	105			
29-d	8/17/93	16:47	2.3	8.5	105			Italics indicate 1:1 dilution
29-d	8/18/93	9:47	1.0	10.2	63			

30-s	8/16/93	11:47	20.4	0.8	50			
30-s	8/16/93	18:36	20.5	0.8	46			
30-s	8/17/93	11:48	19.5	1.1	40			
30-s	8/18/93	10:23	20.5	0.8	61			
30-s	8/19/93	10:39	20.0	0.9	34			
30-s	8/20/93	9:40	19.8	1.0	39			
30-s	8/27/93	11:03	20.0	0.8	36			
30-m	8/16/93	11:47	20.5	0.5	43			
30-m	8/16/93	18:36	21.0	0.6	40			
30-m	8/17/93	11:48	20.0	0.8	40			
30-m	8/18/93	10:23	20.2	0.7	30			
30-m	8/19/93	10:39	19.9	0.8	30		16.4	
30-m	8/20/93	9:40	20.0	0.8	34		15.6	
30-m	8/27/93	11:03	18.9	0.6	7	5.5	18.0	

In situ Respiration Test Data - FE Warren B (8-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
30-d	8/16/93	11:47	19.7	0.9	56			
30-d	8/16/93	18:36	19.5	1.2	30			
30-d	8/17/93	11:48	18.8	1.5	47			
30-d	8/18/93	10:23	20.0	1.0	70			
30-d	8/19/93	10:39	19.7	1.0	40			
30-d	8/20/93	9:40	19.8	1.3	48			
30-d	8/27/93	11:03	19.5	0.9	35			

31-s	8/16/93	11:40	20.5	0.6	50			
31-s	8/16/93	18:31	20.5	0.8	50			
31-s	8/17/93	11:44	20.7	0.9	42			
31-s	8/18/93	10:20	20.5	0.8	32			
31-s	8/19/93	10:36	20.5	0.8	31			
31-s	8/20/93	9:36	20.5	0.8	34			
31-s	8/27/93	10:55	20.4	0.7	27			
31-m	8/16/93	11:40	20.0	0.7	40			
31-m	8/16/93	18:31	19.0	0.7	44			
31-m	8/17/93	11:44	19.8	0.8	45			
31-m	8/18/93	10:20	20.0	0.7	25			
31-m	8/19/93	10:36	19.9	0.8	30		15.7	
31-m	8/20/93	9:36	20.0	0.8	28		15.4	
31-m	8/27/93	10:55	20.9	0.3		13.4	17.3	
31-d	8/16/93	11:40	20.0	1.2	60			
31-d	8/16/93	18:31	19.8	1.2	62			
31-d	8/17/93	11:44	19.8	1.5	44			
31-d	8/18/93	10:20	19.7	1.2	42			
31-d	8/19/93	10:36	19.5	1.1	42			
31-d	8/20/93	9:36	19.5	1.3	49			
31-d	8/27/93	10:55	19.4	0.9	37			

32-s	8/16/93	11:25	21.0	0.3	90			HC Odor
32-s	8/16/93	18:18	21.0	0.3				
32-s	8/27/93	10:52	19.7	0.8	74	13.0		
32-m	8/16/93	11:25	4.5	13.0	190			
32-m	8/16/93	18:18	3.7	13.0	280			
32-m	8/17/93	11:38	4.4	13.9	120			Italics indicate 1:1 dilution
32-m	8/17/93	16:42	5.3	13.5	98			
32-m	8/18/93	9:41	7.0	12.0	130			
32-m	8/19/93	10:32	5.9	14.4	72		17.9	
32-m	8/20/93	9:34	5.7	14.1	83		17.3	
32-m	8/27/93	10:52	10.9	8.5	58	2.3	19.4	
32-d	8/16/93	11:25	3.2	14.5	4800			
32-d	8/16/93	18:18	0.0	20.2	4500			
32-d	8/17/93	11:38	0.0	19.2	2000			Italics indicate 1:1 dilution
32-d	8/17/93	16:42	0.0	18.4	2000			



Sampling Point	Date	Time	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
33-s	8/16/93	11:11	9.5	9.5	72			
33-s	8/16/93	18:01	8.8	9.8	94			
33-s	8/17/93	11:33	11.6	10.8	95			Italics indicate 1:1 dilution
33-s	8/17/93	16:40	11.6	10.2	100			
33-s	8/18/93	9:37	11.3	9.5	76			
33-s	8/19/93	10:29	12.0	9.1	68			
33-s	8/20/93	9:30	12.0	8.9	85			
33-s	8/27/93	10:47	13.9	7.6	72	0.1		
33-m	8/16/93	11:11	7.0	10.0	67			
33-m	8/16/93	18:01	4.5	12.2	60			
33-m	8/17/93	11:33	5.4	14.7	97			Italics indicate 1:1 dilution
33-m	8/17/93	16:40	5.7	14.1	105			
33-m	8/18/93	9:37	7.3	11.5	76			
33-m	8/19/93	10:29	7.2	12.1	70		16.9	
33-m	8/20/93	9:30	7.2	12.0	86		16.3	
33-m	8/27/93	10:47	10.0	9.6	77	0.5	18.1	
33-d	8/16/93	11:11	20.5	0.5	20			
33-d	8/16/93	18:01	1.8	8.2	40			
33-d	8/17/93	11:33	4.4	9.1	2			Italics indicate 1:1 dilution
33-d	8/17/93	16:40	3.9	8.9	0			
33-d	8/18/93	9:37	4.4	8.5	4			
33-d	8/19/93	10:29	4.9	8.8	0			
33-d	8/20/93	9:30	4.5	8.7	0			
33-d	8/27/93	10:47	14.2	3.8	5	8.5		
34-s	8/16/93	11:06	15.3	4.8	76			
34-s	8/16/93	17:26	17.0	4.0	91			
34-s	8/17/93	11:28	13.7	6.0	83			
34-s	8/18/93	10:16	12.3	5.8	70			Italics indicate 1:1 dilution
34-s	8/19/93	10:25	9.9	7.5	55			
34-s	8/20/93	9:26	7.8	8.5	84			
34-s	8/27/93	10:35	7.0	11.4	73			
34-m	8/16/93	11:06	14.5	4.9	83		22.0	
34-m	8/16/93	17:26	15.4	4.5	94			
34-m	8/17/93	11:28	11.7	6.5	89			Italics indicate 1:1 dilution
34-m	8/18/93	10:16	10.2	6.5	73			
34-m	8/19/93	10:25	7.8	8.2	60		21.0	
34-m	8/20/93	9:26	6.0	9.0	87		20.3	
34-m	8/27/93	10:40	5.6	11.2	72	0.3	20.9	
34-d	8/16/93	11:06	15.5	2.3	70			
34-d	8/16/93	17:26	16.0	2.7	84			
34-d	8/17/93	11:28	10.9	5.3	90			
34-d	8/18/93	10:16	9.0	5.9	70			Italics indicate 1:1 dilution
34-d	8/19/93	10:25	6.3	7.7	55			
34-d	8/20/93	9:26	4.2	8.9	84			
34-d	8/27/93	10:40	4.5	11.1	74	0.3		

tu Respiration Test Data - FE Warren AFB (3)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
1-s	11/15/93	15:25	12.0	7.5	90	9	6.8	Blower shut down @ 6:07
1-s	11/16/93	15:25	12.5	6.5	110	9		
1-s	11/17/93	13:10	13.0	7.0	110	9	5.8	
1-s	11/18/93	12:45	13.7	7.0	145	9		
1-s	11/19/93	12:15	14.0	7.0	97	12	4.8	
1-m	11/15/93	15:25	9.2	9.8	93	10	11.2	1:1 diluter was used for TPH readings in italic
1-m	11/16/93	15:25	9.5	8.5	120	9		
1-m	11/17/93	13:10	9.3	9.8	110	9	9	
1-m	11/18/93	12:45	10.3	9.4	140	9		
1-m	11/19/93	12:15	11.2	9.5	110	8	8.9	
1-d	11/15/93	15:25	7.0	11.0	98	10	14.2	1:1 diluter was used for TPH readings in italic
1-d	11/16/93	15:25	7.4	9.8	110	9		
1-d	11/17/93	13:10	7.0	11.5	110	9	11.9	
1-d	11/18/93	12:45	7.7	11.0	145	10		
1-d	11/19/93	12:15	9.2	10.5	125	10	11.7	
2-s	11/15/93	16:00	17.0	4.5	96	9	6.5	
2-s	11/16/93	15:20	18.6	2.9	110	8		
2-s	11/17/93	12:30	18.2	3.5	84	10	6.4	
2-s	11/18/93	12:40	19.1	2.7	82	9		
2-s	11/19/93	12:20	18.2	3.3	78	10	5	
2-m	11/15/93	16:00	16.2	4.8	110	10	-	Thermo-couple off
2-m	11/16/93	15:20	16.5	4.3	110	9	-	
2-m	11/17/93	12:30	16.5	4.8	93	11	-	
2-m	11/18/93	12:40	16.5	4.6	100	10	-	
2-m	11/19/93	12:20	16.5	4.8	98	9	-	
2-d	11/15/93	16:00	16.5	4.4	110	6	13.8	
2-d	11/16/93	15:20	14.8	5.3	130	10		
2-d	11/17/93	12:30	14.5	6.0	98	12	11.8	
2-d	11/18/93	12:40	14.2	6.2	140	10		
2-d	11/19/93	12:20	14.2	6.4	98	13	10.4	
3-s	11/15/93	15:50	18.7	2.4	80	9	8.4	
3-s	11/16/93	15:30	18.2	2.3	100	9		
3-s	11/17/93	12:25	17.8	2.8	74	9	7.1	
3-s	11/18/93	12:35	17.2	3.1	110	9		
3-s	11/19/93	12:55	16.5	3.3	87	10	5.3	
3-m	11/15/93	15:50	18.0	3.0	90	9	14	
3-m	11/16/93	15:30	17.5	2.8	100	9	-	
3-m	11/17/93	12:25	17.5	2.8	80	10	12	
3-m	11/18/93	12:35	17.2	3.2	112	10	-	
3-m	11/19/93	12:55	15.8	3.9	89	10	10.4	
3-d	11/15/93	15:50	17.0	3.9	110	10	15	
3-d	11/16/93	15:30	17.0	3.4	120	9		
3-d	11/17/93	12:25	16.6	3.9	96	10	13	
3-d	11/18/93	12:35	16.1	4.2	98	10		
3-d	11/19/93	12:55	15.7	4.3	98	10	11.2	

In situ Respiration Test Data - FE Warren B (11-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
4-s	11/15/93	15:55	19.3	1.9	72	9	9.5	Blower shut down @ 6:07
4-s	11/16/93	15:10	18.8	2.0	90	19		
4-s	11/17/93	12:15	17.8	1.6	75	9	8.5	
4-s	11/18/93	12:15	16.6	2.8	120	9		
4-s	11/19/93	13:00	15.0	3.1	83	8	6.3	
4-m	11/15/93	15:55	18.5	2.7	90	12	16.1	
4-m	11/16/93	15:10	18.0	2.4	100	11		
4-m	11/17/93	12:15	16.5	3.0	80	8	14.5	
4-m	11/18/93	12:15	14.7	3.4	125	11		
4-m	11/19/93	13:00	12.5	4.0	90	11	11.9	
4-d	11/15/93	15:55	18.5	2.6	98	10	14.2	1:1 diluter was used for TPH reading in <i>italic</i>
4-d	11/16/93	15:10	17.2	2.8	110	9		
4-d	11/17/93	12:15	15.0	3.7	88	9	11.9	
4-d	11/18/93	12:15	12.3	4.5	135	10		
4-d	11/19/93	13:00	10.5	5.2	<i>110</i>	10	11.7	
5-s	11/15/93	15:15	19.5	1.5	46	8	6.4	1:1 diluter was used for TPH readings in <i>italic</i>
5-s	11/16/93	14:55	12.0	5.8	<i>100</i>	9		
5-s	11/16/93	16:10	12.1	5.8	110	9	5.8	
5-s	11/17/93	12:10	12.3	6.3	<i>90</i>	11	6.4	
5-s	11/18/93	12:10	12.2	6.5	<i>110</i>	8		
5-s	11/19/93	12:15	13.0	6.2	110	8	4.6	
5-m	11/15/93	15:15	16.5	3.9	80	9	10	1:1 diluter was used for TPH readings in <i>italic</i>
5-m	11/16/93	14:55	6.0	8.4	<i>110</i>	10	8.4	
5-m	11/16/93	16:10	6.0	8.7	<i>110</i>	9	-	
5-m	11/17/93	12:10	6.9	9.0	<i>97</i>	11	9.7	
5-m	11/18/93	12:10	7.0	9.5	<i>110</i>	8	-	
5-m	11/19/93	12:15	7.5	9.8	<i>110</i>	9	7.6	
5-d	11/15/93	15:15	12.5	6.5	92	6	13.8	1:1 diluter was used for TPH readings in <i>italic</i>
5-d	11/16/93	14:55	2.2	11.0	<i>110</i>	10		
5-d	11/16/93	16:10	2.5	11.0	<i>110</i>	10		
5-d	11/17/93	12:10	2.5	11.5	98	12	11.8	
5-d	11/18/93	12:10	3.3	12.0	<i>120</i>	10		
5-d	11/19/93	12:15	3.0	13.6	<i>110</i>	13	10.4	
6-s	11/15/93	15:30	19.5	2.0	76	10	6.6	
6-s	11/16/93	14:40	19.2	1.9	62	9		
6-s	11/17/93	11:55	18.5	2.3	72	9		
6-s	11/18/93	12:00	17.7	2.5	80	11		
6-s	11/19/93	12:10	16.8	2.8	73	11	6.1	
6-m	11/15/93	15:30	19.7	1.3	77	12	15.4	
6-m	11/16/93	14:40	18.4	2.3	68	11	-	
6-m	11/17/93	11:55	17.5	2.8	80	11	13.6	
6-m	11/18/93	12:00	16.1	3.3	92	15	-	
6-m	11/19/93	12:10	15.5	3.5	85	14	12.3	
6-d	11/15/93	15:30	18.6	2.6	87	10	10.8	
6-d	11/16/93	14:40	17.5	2.8	79	9		
6-d	11/17/93	11:55	16.3	3.5	90	10		
6-d	11/18/93	12:00	14.2	4.0	99	12		
6-d	11/19/93	12:10	14.2	4.3	94	11	8.8	

situ Respiration Test Data - FE Warren AFT -93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
7-s	11/15/93	16:30	20.0	1.5	60	15		Blower shut down @ 6:07
7-s	11/16/93	14:36	20.0	1.3	54	15		
7-s	11/17/93	11:35	19.8	1.5	60	15		
7-s	11/18/93	11:50	19.8	1.7	61	17		
7-s	11/19/93	12:10	19.0	1.8	55	19		
7-m	11/15/93	16:30	-	-	-	-	11.4	no flow
7-m	11/16/93	14:36	19.8	1.3	50	9		
7-m	11/17/93	11:35	19.6	1.6	60	10	9.1	
7-m	11/18/93	11:50	19.5	1.8	68	13		
7-m	11/19/93	12:10	19.2	2.1	59	12	11.4	
7-d	11/15/93	16:30	20.1	1.3	56	8		
7-d	11/16/93	14:36	19.8	1.3	52	10		
7-d	11/17/93	11:35	19.5	1.5	58	10		
7-d	11/18/93	11:50	19.0	1.9	67	14		
7-d	11/19/93	12:10	19.0	2.1	61	12		
8-s	11/15/93	16:30	18.5	3.3	81	8		
8-s	11/16/93	14:33	18.8	2.9	80	8		
8-s	11/17/93	11:10	19.2	2.4	78	11		
8-s	11/18/93	11:35	19.2	2.8	78	12		
8-s	11/19/93	12:05	18.7	3.1	76	8		
8-m	11/15/93	16:30	18.8	3.2	86	9	13.3	
8-m	11/16/93	14:33	18.3	3.0	81	9	12.8	
8-m	11/17/93	11:10	18.3	3.0	90	11	12.4	
8-m	11/18/93	11:35	18.2	3.5	89	11		
8-m	11/19/93	12:05	18.2	3.6	84	8	13.9	
8-d	11/15/93	16:30	18.9	3.0	83	9		
8-d	11/16/93	14:33	18.3	3.1	80	9		
8-d	11/17/93	11:10	17.8	3.4	90	13		
8-d	11/18/93	11:35	17.8	3.6	87	10		
8-d	11/19/93	12:05	17.5	3.8	85	9		
9-s	11/15/93	16:40	20.5	0.8	43	8		
9-s	11/16/93	15:30	20.1	1.0	46	7		
9-s	11/17/93	11:05	19.8	1.2	44	11		
9-s	11/18/93	11:30	19.3	1.5	54	8		
9-s	11/19/93	11:35	19.2	1.5	50	8		
9-m	11/15/93	16:40	-	-	-	-		no flow
9-m	11/16/93	15:30	20.3	0.8	37	8	14.6	
9-m	11/17/93	11:05	19.8	0.9	37	10	12.6	
9-m	11/18/93	11:30	19.5	1.0	42	10	-	
9-m	11/19/93	11:35	19.1	1.1	45	10	12	
9-d	11/15/93	16:40	-	-	-	-		no flow
9-d	11/16/93	15:30	20.3	0.8	38	9		
9-d	11/17/93	11:05	19.8	0.9	40	13		
9-d	11/18/93	11:30	19.3	1.1	42	10		
9-d	11/19/93	11:40	19.0	1.2	50	14		

In situ Respiration Test Data - FE Warren 3 (11-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
10-s	11/15/93	15:10	13.9	5.8	98	8		
10-s	11/16/93	13:25	13.5	5.7	85	9		
10-s	11/17/93	11:45	14.5	6.0	100	8		
10-s	11/18/93	12:10	14.3	6.3	130	11		
10-s	11/19/93	11:20	14.3	6.3	100	8		
10-m	11/15/93	15:10	12.8	6.8	96	8		no flow
10-m	11/16/93	13:25	13.0	6.2	87	9		
10-m	11/17/93	11:45	12.5	7.0	100	9	14.5	
10-m	11/18/93	12:10	12.7	6.8	140	9		
10-m	11/19/93	11:20	12.8	7.4	120	9	14.1	
10-d	11/15/93	15:10	13.5	6.0	97	10		
10-d	11/16/93	13:25	12.8	6.5	89	11		
10-d	11/17/93	11:45	10.8	7.8	100	11		
10-d	11/18/93	12:10	10.8	8.2	140	11		
10-d	11/19/93	11:20	10.5	8.8	110	11		with dilution
11-s	11/15/93	15:00	16.0	4.7	91	12		
11-s	11/16/93	14:00	15.8	4.5	78	11		
11-s	11/16/93	16:15	15.8	4.5	100	11		
11-s	11/17/93	11:40	15.3	4.8	95	9		
11-s	11/18/93	12:05	15.2	4.5	135	10		
11-s	11/19/93	11:25	15.0	4.6	95	8		
11-m	11/15/93	15:00	19.5	1.8	50	10		no flow
11-m	11/16/93	14:00	14.0	5.0	82	10		
11-m	11/16/93	16:15	14.1	5.0	110	10	10	
11-m	11/17/93	11:40	12.0	6.0	92	11	10.8	with dilution
11-m	11/18/93	12:05	11.2	6.5	140	14		with dilution
11-m	11/19/93	11:25	11.4	6.5	100	14	10.9	
11-d	11/15/93	15:00	14.5	5.4	95	10		with dilution
11-d	11/16/93	14:00	8.5	7.0	95	9		with dilution
11-d	11/16/93	16:15	8.5	7.2	110	9		with dilution
11-d	11/17/93	11:40	5.0	8.8	99	10		with dilution
11-d	11/18/93	12:05	0.5	11.8	140	11		with dilution
11-d	11/19/93							
12-s	11/15/93	15:10	19.5	2.2	74	9		
12-s	11/16/93	14:02	19.3	2.0	50	9		
12-s	11/17/93	11:15	19.1	2.2	74	10		
12-s	11/18/93	12:50	18.8	2.3	75	9		
12-s	11/19/93	11:30	18.5	2.4	74	8		
12-m	11/15/93	15:10	19.5	2.3	74	10	10.8	
12-m	11/16/93	14:02	19.0	2.0	55	9	11	
12-m	11/17/93	11:15	18.8	2.3	76	10	6.1	
12-m	11/18/93	12:50	18.2	2.5	80	10		
12-m	11/19/93	11:30	18.2	2.5	71	9	8.1	
12-d	11/15/93	15:10	19.5	1.9	70	10		
12-d	11/16/93	14:02	19.1	1.9	53	9		
12-d	11/17/93	11:15	18.5	2.4	76	10		
12-d	11/18/93	12:50	18.0	2.7	84	10		
12-d	11/19/93	11:30	17.8	2.7	80	10		

Respiration Test Data - FE Warren AFB (11-1)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
13-s	11/15/93	14:55	18.4	3.1	80	10		
13-s	11/16/93	14:05	18.4	2.8	64	8		
13-s	11/17/93	11:15	17.6	3.2	88	11		
13-s	11/18/93	11:40	16.9	3.3	85	7.5		
13-s	11/19/93	11:30	16.3	3.4	86	8		
13-m	11/15/93	14:55	18.5	2.8	75	9	14.3	
13-m	11/16/93	14:05	18.3	2.8	63	9	16	
13-m	11/17/93	11:15	17.0	3.3	91	13	12.1	
13-m	11/18/93	11:40	16.2	3.5	87	8		
13-m	11/19/93	11:30	15.1	3.7	92	9	12.6	
13-d	11/15/93	14:55	19.8	1.3	60	9		
13-d	11/16/93	14:05	19.5	1.2	32	9		
13-d	11/17/93	11:15	18.0	1.7	67	11		
13-d	11/18/93	11:40	16.8	2.0	67	9		
13-d	11/19/93	11:30	15.4	2.3	70	10		
14-s	11/15/93	14:50	18.4	3.1	84	10		
14-s	11/16/93	14:10	18.5	2.9	63	9		
14-s	11/17/93	10:55	18.4	2.8	73	10		
14-s	11/18/93	11:25	17.8	3.3	84	12		
14-s	11/19/93	11:35	17.7	3.2	86	8		
14-m	11/15/93	14:50	18.9	2.5	80	10		
14-m	11/16/93	14:10	18.3	2.8	62	10	16.5	
14-m	11/17/93	10:55	17.5	3.3	78	12	10.1	
14-m	11/18/93	11:25	17.3	3.5	86	11		
14-m	11/19/93	11:35	17.1	3.5	92	9	12.8	
14-d	11/15/93	14:50	-	-	-	-	-	
14-d	11/16/93	14:10	18.5	2.3	56		-	
14-d	11/17/93	10:55	17.6	2.9	75	10	-	
14-d	11/18/93	11:25	17.2	3.3	83	10	-	
14-d	11/19/93	11:35	16.6	3.5	90	9	-	
15-s	11/15/93	14:25	20.0	1.5	58	58		
15-s	11/16/93	13:10	20.2	1.4	40	40		
15-s	11/17/93	10:20	20.2	1.4	53	53		
15-s	11/18/93	10:55	19.8	1.7	56	56		
15-s	11/19/93	10:45	20.0	1.4	52	13		
15-m	11/15/93	14:25	20.2	1.2	53	9	12.4	
15-m	11/16/93	13:10	20.2	1.1	35	9		
15-m	11/17/93	10:20	20.0	1.2	52	10	10	
15-m	11/18/93	10:55	19.8	1.5	64	8		
15-m	11/19/93	10:45	20.0	1.2	68	9	9.9	
15-d	11/15/93	14:25	20.7	0.7	16	9		
15-d	11/16/93	13:10	20.5	0.7	14	9		
15-d	11/17/93	10:20	20.2	0.8	32	10		
15-d	11/18/93	10:55	19.8	1.0	4.8	9		
15-d	11/19/93	10:45	20.0	0.9	45	13		

## In situ Respiration Test Data - FE Warren AFB (11/93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
19-s	11/15/93	14:45	19.0	2.2	66	8		
19-s	11/16/93	11:50	18.8	2.5	60	9		
19-s	11/17/93	10:50	17.0	3.0	76	11		
19-s	11/18/93	11:15	15.7	3.3	85	10		
19-s	11/19/93	10:30	14.5	3.6	95	14		
19-m	11/15/93	14:45	19.2	2.0	71	8		
19-m	11/16/93	11:50	19.7	1.3	41	9		
19-m	11/17/93	10:50	17.6	2.4	70	9	11.8	
19-m	11/18/93	11:15	15.0	3.4	86	9		
19-m	11/19/93	10:30	14.1	3.6	94	15	12.5	
19-d	11/15/93	14:45	20.2	0.8	34	9		
19-d	11/16/93	11:50	19.5	1.4	44	10		
19-d	11/17/93	10:50	17.8	2.1	63	10		
19-d	11/18/93	11:15	16.2	2.7	76	9		
19-d	11/19/93	10:30	15.0	2.7	80	13		
20-s	11/15/93	14:20	20.5	0.7	32	8		
20-s	11/16/93	11:00	20.8	0.7	11			
20-s	11/17/93	10:15	20.3	0.7	24	9		
20-s	11/18/93	10:45	20.5	0.8	38	10		
20-s	11/19/93	9:50	20.5	0.8	30	7		
20-m	11/15/93	14:20	20.5	0.7	30	10		
20-m	11/16/93	11:00	20.8	0.7	20		11.3	
20-m	11/17/93	10:15	20.5	0.7	20	10		
20-m	11/18/93	10:45	20.0	0.7	20	11		
20-m	11/19/93	9:50	20.5	0.7	22	10	8.4	
20-d	11/15/93	14:20	20.8	0.6	14	9		
20-d	11/16/93	11:00	20.9	0.6	4	9		
20-d	11/17/93	10:15	20.8	0.6	9	10		
20-d	11/18/93	10:45	20.6	0.6	12	10		
20-d	11/19/93	9:50	20.6	0.6	10	9		
21-s	11/15/93	13:20	20.2	0.8	31	10		
21-s	11/16/93	11:30	20.5	0.8	24	9		
21-s	11/17/93	10:05	20.4	0.8	42	8		
21-s	11/18/93	10:40	20.5	1.0	45	11		
21-s	11/19/93	9:55	20.5	0.9	45	8		
21-m	11/15/93	13:20	20.5	0.8	34	10	11.5	
21-m	11/16/93	11:30	20.5	0.8		11		
21-m	11/17/93	10:05	20.3	0.8	39	11	10.3	
21-m	11/18/93	10:40	20.5	0.9	43	15		
21-m	11/19/93	9:55	20.2	0.3	40	11	7.7	
21-d	11/15/93	13:20	20.8	0.6	28	13		
21-d	11/16/93	11:30	20.8	0.6	14	9		
21-d	11/17/93	10:05	20.7	0.7	19	9		
21-d	11/18/93	10:40	20.5	0.7	20	13		
21-d	11/19/93	9:55	20.5	0.7	22	9		

# In Situ Respiration Test Data - FE Warren AFB (11/15/93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
16-s	11/15/93	14:25	20.8	0.6	60	8		
16-s	11/16/93	13:07	20.0	1.2	35	8		
16-s	11/17/93	10:25	19.8	1.3	53	7		
16-s	11/18/93	11:00	19.5	1.7	56	7		
16-s	11/19/93	10:40	19.5	1.5	60	12		
16-m	11/15/93	14:25	20.0	0.9	48	9	14	
16-m	11/16/93	13:07	20.2	0.9	30	7		
16-m	11/17/93	10:25	19.8	1.0	44	7	11.5	
16-m	11/18/93	11:00	19.5	1.2	54	9		
16-m	11/19/93	10:40	19.5	1.3	51	13	9.9	
16-d	11/15/93	14:25	20.5	0.7	26	11		
16-d	11/16/93	13:07	20.5	0.7	18	10		
16-d	11/17/93	10:25	20.0	0.8	37	10		
16-d	11/18/93	11:00	19.5	1.0	50	10		
16-d	11/19/93	10:40	19.5	1.0	48	13		
17-s	11/15/93	14:30	20.8	0.6	12	10		
17-s	11/16/93	13:03	19.0	2.0	58	8		
17-s	11/17/93	10:30	19.0	2.0	66	8		
17-s	11/18/93	11:05	18.0	2.6	90	7		
17-s	11/19/93	10:35	18.1	2.5	80	12		
17-m	11/15/93	14:30	19.8	1.4	58	10	14.2	
17-m	11/16/93	13:03	19.5	1.4	43	8		
17-m	11/17/93	10:30	18.8	1.8	60	9	10.2	
17-m	11/18/93	11:05	18.0	2.3	80	8		
17-m	11/19/93	10:35	18.2	2.2	70	16	10.6	
17-d	11/15/93	14:30	20.8	0.6	34	10		
17-d	11/16/93	13:03	19.9	0.8	35	8		
17-d	11/17/93	10:30	19.0	1.3	49	10		
17-d	11/18/93	11:05	18.0	1.9	74	9		
17-d	11/19/93	10:35	18.1	1.9	70	16		
18-s	11/15/93	14:40	16.5	5.0	96	11		
18-s	11/16/93	13:00	16.5	4.7	84	9		
18-s	11/17/93	10:40	15.8	4.9		11		
18-s	11/18/93	11:10	15.0	5.6	110	12		
18-s	11/19/93	10:35	14.5	5.1	110	15		
18-m	11/15/93	14:40	16.8	4.6	97	10		
18-m	11/16/93	13:00	16.6	4.3	81	9		
18-m	11/17/93	10:40	15.3	4.9	95	10	11.4	
18-m	11/18/93	11:10	14.3	5.3	120	11		
18-m	11/19/93	10:35	13.3	5.5	110	15	13.3	
18-d	11/15/93	14:40	18.2	3.0	75	10		
18-d	11/16/93	13:00	17.5	3.2	71	9		
18-d	11/17/93	10:40	15.7	3.8	88	10		
18-d	11/18/93	11:10	14.0	4.5	110	11		
18-d	11/19/93	10:35	13.2	4.9	110	15		



u Respiration Test Data - FE Warren AFB (1)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
22-s	11/15/93	13:10	19.7	1.5	62	8		
22-s	11/16/93	10:50	19.7	1.4	43	9		
22-s	11/17/93	10:00	19.5	1.5	58	8		
22-s	11/18/93	10:30	19.5	1.8	64	11		
22-s	11/19/93	10:00	19.5	1.5	68	8		
22-m	11/15/93	13:10	20.2	0.8	46	8	12.4	
22-m	11/16/93	10:50	20.2	0.8	32	9		
22-m	11/17/93	10:00	20.0	0.8	39	9	11.6	
22-m	11/18/93	10:30	19.7	1.1	47	9		
22-m	11/19/93	10:00	19.5	1.0	55	9	8.9	
22-d	11/15/93	13:10	20.9	0.7	33	10		
22-d	11/16/93	10:50	20.5	0.7	20	11		
22-d	11/17/93	10:00	20.0	0.7	25.0	11		
22-d	11/18/93	10:30	20.0	0.8	30	11		
22-d	11/19/93	10:00	20.1	0.8	30	11		
23-s	11/15/93	13:05	20.2	0.9	41	12		
23-s	11/16/93	11:40	20.4	0.9	29	8		
23-s	11/17/93	9:55	19.8	0.9	40	10		
23-s	11/18/93	10:25	19.5	1.3	52	10		
23-s	11/19/93	10:45	19.2	1.0	58	12		
23-m	11/15/93	13:05	20.5	0.7	35	17	11.2	
23-m	11/16/93	11:40	20.5	0.7	19	12		
23-m	11/17/93	9:55	20.1	0.7	32	16	10.7	
23-m	11/18/93	10:25	19.5	0.8	36	14		
23-m	11/19/93	10:45	20.0	0.8	34	16	8	
23-d	11/15/93	13:05	20.8	0.6	14	14		
23-d	11/16/93	11:40	20.8	0.6				
23-d	11/17/93	9:55	20.3	0.7	13.0	13		
23-d	11/18/93	10:25	19.5	0.7	10	10		
23-d	11/19/93	10:45	19.5	0.7	11	11		
24-s	11/15/93	13:00	19.1	2.3	70	12		
24-s	11/16/93	10:50	18.2	2.3	58	9		
24-s	11/17/93	11:45	18.8	2.4	72	8		
24-s	11/18/93	9:45	18.4	2.7	60	12		
24-s	11/19/93	10:20	18.2	2.6	82	13		
24-m	11/15/93	13:00	19.5	2.1	58	12	10.8	
24-m	11/16/93	10:50	19.5	1.8	50	9		
24-m	11/17/93	11:45	18.8	2.0	66	9	11.7	
24-m	11/18/93	9:45	18.2	2.3	52	13		
24-m	11/19/93	10:20	19.0	1.6	60	12	9.1	
24-d	11/15/93	13:00	20.1	1.0	36	12		
24-d	11/16/93	10:50	19.7	1.5	43	9		
24-d	11/17/93	11:45	19.5	1.3	52.0	10.0		
24-d	11/18/93	9:45	18.5	2.2	50	13		
24-d	11/19/93	10:20	17.9	2.2	80	13		

Respiration Test Data - FE Warren AFB (11/15/93 - 11/19/93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
25-s	11/15/93	11:30	20.0	1.3	63	12		
25-s	11/16/93	10:45	20.1	1.3	20	11		
25-s	11/17/93	9:15	19.8	1.3	50	10		
25-s	11/18/93	9:50	19.8	1.6	60	13		
25-s	11/19/93	8:35	20.0	1.4	72	12		
25-m	11/15/93	11:30	20.8	0.8	39	22	10.4	
25-m	11/16/93	10:45	20.8	0.8	20	19		
25-m	11/17/93	9:15	20.2	0.7	40	19	8.8	
25-m	11/18/93	9:50	20.2	0.9	37	21		
25-m	11/19/93	8:35	20.5	0.8	40	22	9.8	
25-d	11/15/93	11:30	21.0	0.6	12	10		
25-d	11/16/93	10:45	21.0	0.6	4	11		
25-d	11/17/93	9:15	20.5	0.6	14.0	10		
25-d	11/18/93	9:50	20.5	0.7	15	14		
25-d	11/19/93	8:35	20.5	0.7	30	14		
26-s	11/15/93	12:30	20.5	0.7	33	12		
26-s	11/16/93	10:15	20.5	0.8	37	12		
26-s	11/17/93	9:20	20.5	0.8	32	10		
26-s	11/18/93	9:55	20.3	0.8	30	8		
26-s	11/19/93	8:45	20.3	0.8	40	12		
26-m	11/15/93	12:30	20.5	0.7	35	13	11.5	
26-m	11/16/93	10:15	20.5	0.7	30	10		
26-m	11/17/93	9:20	20.5	0.7	30	10	9	
26-m	11/18/93	9:55	20.2	0.8	26	9		
26-m	11/19/93	8:45	20.2	0.7	28	10	9.8	
26-d	11/15/93	12:30	20.9	0.6	32	9		
26-d	11/16/93	10:15	20.9	0.6	26	10		
26-d	11/17/93	9:20	20.5	0.7	28.0	10		
26-d	11/18/93	9:55	20.1	0.8	32	9		
26-d	11/19/93	8:45	20.2	0.6	26	10		
27-s	11/15/93	12:40	16.1	4.2	82	12		
27-s	11/16/93	10:10	15.5	4.5	110	10		
27-s	11/17/93	9:30	16.3	4.4	93	10		
27-s	11/18/93	10:05	16.0	4.4	100	11		
27-s	11/19/93	8:05	15.7	3.9	110	15		
27-m	11/15/93	12:40	17.8	3.2	80	13	13.2	
27-m	11/16/93	10:10	16.3	3.6	91	10		
27-m	11/17/93	9:30	14.5	4.3	93	10	9.4	
27-m	11/18/93	10:05	13.4	4.7	100	11		
27-m	11/19/93	8:05	12.8	4.5	120	14	10	
27-d	11/15/93	12:40	18.9	1.9	61	-		
27-d	11/16/93	10:10	18.2	2.0	82	10		
27-d	11/17/93	9:30	16.0	3.0	82.0	11		
27-d	11/18/93	10:05	14.2	2.9	95	10		
27-d	11/19/93	8:05	13.8	3.8	120	15		

In situ Respiration Test Data - FE Warren (11-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
28-s	11/15/93	12:45	8.9	8.5	93	8		*with 1:1 dilutor
28-s	11/16/93	10:08	8.9	8.7	96	9		
28-s	11/17/93	9:35	8.5	8.5	97	11		
28-s	11/18/93	10:10	10.7	7.2	94	12		
28-s	11/19/93	8:02	8.8	7.7	120	14		
28-m	11/15/93	12:45	7.9	9.5	95	9	15.8	14.8C @ 10:40 am
28-m	11/16/93	10:08	7.9	8.9	97	10		
28-m	11/17/93	9:35	6.7	9.2	98	10	11.7	
28-m	11/18/93	10:10	6.6	9.2	100	12	11	
28-m	11/19/93	8:02	6.5	9.5	130	14	11.7	
28-d	11/15/93	12:45	10.5	7.5	92	9		
28-d	11/16/93	10:08	10.0	7.2	100	10		
28-d	11/17/93	9:35	8.0	7.7	97.0	11		
28-d	11/18/93	10:10	5.7	8.9	150	12		
28-d	11/19/93	8:02	5.2	8.6	130	14		
29-s	11/15/93	12:50	18.0	3.0	72	8		
29-s	11/16/93	10:02	17.8	2.9	90	9		
29-s	11/17/93	16:40	17.4	3.2	130	8		
29-s	11/18/93	9:40	15.5	3.4	84	11		
29-s	11/18/93	10:15	14.8	3.8	90	11		
29-s	11/19/93	8:00	13.7	3.2	110	8		
29-m	11/15/93	12:50	19.5	1.5	50	8	14.3	
29-m	11/16/93	10:02	15.3	4.0	100	9		
29-m	11/17/93	16:40	13.3	4.5	130	9		
29-m	11/18/93	9:40	10.0	5.3	88	9	11.7	
29-m	11/18/93	10:15	5.3	6.8	100	9		
29-m	11/19/93	8:00	4.8	7.0	130	9	10.7	
29-d	11/15/93	12:50	15.9	4.3	96	10		
29-d	11/16/93	10:02	17.5	2.2	90	11		
29-d	11/17/93	16:40	14.2	6.7	120.0	11		
29-d	11/18/93	9:40	8.9	5.5	90	11		
29-d	11/18/93	10:15	3.0	8.0	100	11		
29-d	11/19/93	8:00	2.0	13.8	130	11		
30-s	11/15/93	12:00	20.5	0.9	52	11		
30-s	11/16/93	9:00	20.5	0.9	44	9		
30-s	11/17/93	9:05	20.5	0.8	37	9		
30-s	11/18/93	9:45	20.5	1.0	43	12		
30-s	11/19/93	8:30	20.5	0.8	49	12		
30-m	11/15/93	12:00	20.6	0.7	54	13	7.4	9.7C @ 4:00 pm
30-m	11/16/93	9:00	20.5	0.8	49	17		
30-m	11/17/93	9:05	20.3	1.0	60	17	7.3	
30-m	11/18/93	9:45	20.5	1.2	48	21		
30-m	11/19/93	8:30	20.5	1.0	56	20	8.1	
30-d	11/15/93	12:00	20.3	1.4	63	14		
30-d	11/16/93	9:00	20.3	1.5	57	10		
30-d	11/17/93	9:05	20.1	1.3	60.0	10		
30-d	11/18/93	9:45	20.0	1.5	70	14		
30-d	11/19/93	8:30	20.4	1.3	65	14		

## In situ Respiration Test Data - FE Warren B (11-93)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
31-s	11/15/93	11:55	20.5	0.8	34	8		
31-s	11/16/93	9:07	20.5	0.8	31	9		
31-s	11/17/93	9:00	20.5	0.8	40	3		
31-s	11/18/93	21:40	16.5	2.7	90	10		
31-s	11/19/93	8:25	20.5	0.9	60	12		
31-m	11/15/93	11:55	20.5	0.8	41	20	9.9	
31-m	11/16/93	9:07	20.5	0.8	36	15		
31-m	11/17/93	9:00	20.5	0.8	40	17	8.6	
31-m	11/18/93	21:40	14.5	3.8	100	14	14.2	
31-m	11/19/93	8:25	20.5	0.8	40	20	8.5	
31-d	11/15/93	11:55	20.2	1.5	70	11		
31-d	11/16/93	9:07	20.2	1.2	64	12		
31-d	11/17/93	9:00	20.2	1.5	63.0	11.0		
31-d	11/18/93	9:40	13.0	4.2	100	14		
31-d	11/19/93	8:25	20.3	1.5	80	15		
32-s	11/15/93	11:50	9.0	8.0	93	18		w/1:1 diluter
32-s	11/16/93					20		clogged
32-m	11/15/93	11:50	4.2	13.5	90	8	12.4	w/1:1 diluter
32-m	11/16/93	9:20	4.5	11.5	260	9		
32-m	11/16/93	10:59	4.9	11.5	260	9	11.6	
32-m	11/17/93	16:30	5.3	11.5	260	9		
32-m	11/18/93	9:00	5.5	12.5	110	9		
32-m	11/19/93	9:30	6.2	11.8	130	9		
32-m	11/19/93	8:20	7.0	11.2	150	9	8.9	
32-d	11/15/93	11:50	16.0	5.2	800	10		
32-d	11/16/93	9:20	2.8	13.5	1400	11		w/1:1 diluter
32-d	11/16/93	10:59	0.2	13.2	1400	11		
32-d	11/16/93	16:30	0.0	14.0	1200	11		
32-d	11/17/93	9:00	0.0	15.5	1400	11		
32-d	11/18/93	9:30	0.0	15.5	1400	11		
33-s	11/15/93	13:35	15.0	4.5	75	8		
33-s	11/16/93	9:30	14.3	5.2	120	9		
33-s	11/17/93	16:35	14.3	5.2	130			
33-s	11/18/93	8:50	14.0	5.5	110	10		
33-s	11/18/93	9:25	14.5	5.5	110	8		
33-s	11/19/93	8:15	15.0	5.5	110	12		
33-m	11/15/93	13:35	12.2	6.6	110	11	13.1	
33-m	11/16/93	9:30	11.8	6.5	120	11		
33-m	11/16/93	16:35	11.7	6.8	130		10.2	
33-m	11/17/93	8:50	11.0	7.5	220	13	11.9	
33-m	11/18/93	9:25	11.2	7.7	150	11	12.0	
33-m	11/19/93	8:15	12.5	7.5	160	16	10.1	
33-d	11/15/93	13:35	0.0	13.5	500	11		
33-d	11/16/93	9:30	2.0	12.0	600	11		
33-d	11/17/93	16:35	5.0	9.0	430			
33-d	11/18/93	8:50	0.0	13.8	880	12		
33-d	11/18/93	9:25	0.0	13.5	470	10		
33-d	11/19/93	8:15	1.8	12.5	540	13		

Respiration Test Data - FE Warren AFB (1)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
34-s	11/15/93	11:30	19.2	1.5	10	10		
34-s	11/16/93	9:45	19.2	1.7	9	9		
34-s	11/17/93	8:45	17.3	2.5	13	13		
34-s	11/18/93	9:20	16.5	2.7	10	10		
34-s	11/19/93	7:50	16.2	2.9	13	13		
34-m	11/15/93	11:30	18.8	2.0	12	12	17.4	
34-m	11/16/93	9:45	18.8	2.3	11	11		
34-m	11/17/93	8:45	15.8	3.3	14	14	13.9	
34-m	11/18/93	9:20	14.5	3.8	14	14		
34-m	11/19/93	7:50	13.3	3.9	15	15	11.1	
34-d	11/15/93	11:30	18.5	2.1	9	9		
34-d	11/16/93	9:45	18.2	2.7	9	9		
34-d	11/17/93	8:45	14.8	3.5	9.0	9		
34-d	11/18/93	9:20	13.0	4.2	14	14		
34-d	11/19/93	7:50	11.8	4.3	14	14		

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
1-s	2/25/94	12:22	15.5	5.8	130	7.0	-0.7	
1-s	2/25/94	16:00	15.5	5.5	150	5.0	-1.1	
1-s	2/26/94	9:50	15.3	5.7	130	12.0	-2.0	
1-s	2/27/94	10:45	15.7	5.5	120	9.0	-1.5	
1-s	2/28/94	9:19	16.5	5.8	100	9.5	-0.7	
1-s	3/1/94	11:20	16.0	5.7	90	9.5	-1.3	
1-m	2/25/94	12:22	14.0	6.3	130	-	1.5	
1-m	2/25/94	16:00	14.9	6.0	150	5.0	1.3	
1-m	2/26/94	9:50	14.3	6.3	130	12.0	1.0	
1-m	2/27/94	10:45	14.6	6.4	125	9.0	0.9	
1-m	2/28/94	9:19	14.7	6.3	100	10.0	1.3	
1-m	3/1/94	11:20	14.3	7.0	90	10.0	0.9	
1-d	2/25/94	12:22	15.0	6.0	140	5.5	4.9	
1-d	2/25/94	16:00	14.0	6.2	150	5.0	4.4	
1-d	2/26/94	9:50	13.5	6.7	130	11.0	3.8	
1-d	2/27/94	10:45	13.5	6.8	125	9.5	3.6	
1-d	2/28/94	9:19	13.5	7.0	100	10.0	4.6	
1-d	3/1/94	11:20	13.1	7.7	92	11.0	4.1	
2-s	2/25/94	12:16	19.2	2.7	93	4.0	-0.3	
2-s	2/25/94	15:47	19.2	2.7	125	4.5	-0.9	
2-s	2/26/94	9:58	19.7	2.4	92	8.0	-0.4	
2-s	2/27/94	10:40	19.5	2.1	91	10.5	-1.3	
2-s	2/28/94	9:26	19.3	2.2	60	8.0	-0.7	
2-s	3/1/93	11:14	19.4	1.8	64	8.0	-1.0	
2-m	2/25/94	12:16	19.0	2.8	94	6.5	-	
2-m	2/25/94	15:47	19.0	2.7	120	5.5	-	
2-m	2/26/94	9:58	19.0	2.9	100	9.0	-	
2-m	2/27/94	10:40	18.8	2.9	100	9.0	-	
2-m	2/28/94	9:26	18.5	4.0	86	9.0		
2-m	3/1/94	11:14	18.7	4.6	76	9.0		
2-d	2/25/94	12:16	18.3	3.3	110	10.0	5.0	
2-d	2/25/94	15:47	18.3	3.3	135	4.8	4.7	
2-d	2/26/94	9:58	18.0	3.4	110	10.0	4.5	
2-d	2/27/94	10:40	17.8	3.3	110	10.0	4.4	
2-d	2/28/94	9:26	17.7	3.5	92	10.0	4.7	
2-d	3/1/94	11:14	3.5	80.0	9.5	9.4		
3-s	2/25/94	12:10	20.2	1.2	56	5.0	-0.2	
3-s	2/25/94	15:42	20.2	1.3	90	4.0	-0.1	
3-s	2/26/94	10:02	19.7	1.6	77	9.0	-0.5	
3-s	2/27/94	10:35	19.3	1.5	79	10.0	-0.9	
3-s	2/28/94	9:32	19.0	1.7	65	9.0	-0.4	
3-s	3/1/94	11:08	18.8	1.6	63	8.5	-0.6	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
3-m	2/25/94	12:10	20.0	1.5	68	6.5	4.3	
3-m	2/25/94	15:42	20.0	1.5	100	7.0	4.2	
3-m	2/26/94	10:02	19.5	1.8	88	9.0	3.2	
3-m	2/27/94	10:35	19.0	1.7	84	10.0	3.2	
3-m	2/28/94	9:32	18.7	1.9	70	9.0	3.8	
3-m	3/1/94	11:08	18.5	1.9	66	9.0	3.6	
3-d	2/25/94	12:10	19.3	2.0	81	6.5	6.8	
3-d	2/25/94	15:42	19.3	2.0	120	5.0	6.7	
3-d	2/26/94	10:02	19.0	2.3	93	9.0	5.9	
3-d	2/27/94	10:35	18.8	2.1	92	9.0	7.5	
3-d	2/28/94	9:32	18.5	2.3	76	10.0	6.4	
3-d	3/1/94	11:08	18.3	2.3	73	9.5	6.2	
4-s	2/25/94	12:03	19.5	1.7	73	6.0	0.3	
4-s	2/25/94	15:38	19.5	1.7	110	4.0	0.9	
4-s	2/26/94	10:06	18.9	2.2	90	8.5	0.3	
4-s	2/27/94	10:30	18.1	2.1	90	9.0	0.0	
4-s	2/28/94	9:36	17.2	2.3	72	11.0	0.7	
4-s	3/1/94	11:02	17.0	2.3	70	10.0	0.7	
4-m	2/25/94	12:03	18.7	2.3	87	8.0	2.1	
4-m	2/25/94	15:38	18.8	2.4	120	5.5	2.4	
4-m	2/26/94	10:06	17.8	2.7	100	11.0	6.2	
4-m	2/27/94	10:30	16.8	2.8	98	11.0	6.6	
4-m	2/28/94	9:36	15.7	3.2	80	11.5	7.1	
4-m	3/1/94	11:02	15.0	3.3	80	11.5	6.7	
4-d	2/25/94	12:03	18.5	2.3	96	16.0	4.3	
4-d	2/25/94	15:38	17.6	2.8	130	12.0	4.2	
4-d	2/25/94	16:39	17.4	2.8	130			
4-d	2/26/94	10:06	16.0	3.5	120	10.0	3.2	
4-d	2/27/94	10:30	14.8	3.9	120	10.0	3.2	
4-d	2/28/94	9:36	13.8	4.3	93	10.5	3.7	
4-d	3/1/94	11:02	13.0	4.5	94	11.0	3.5	
5-s	2/25/94	11:56	16.7	3.7	110	5.0	0.5	
5-s	2/25/94	15:34	16.9	3.5	140	5.0	-0.7	
5-s	2/26/94	10:11	16.8	3.7	110	9.0	-1.6	
5-s	2/27/94	10:55	16.8	3.5	105	9.5	-1.5	
5-s	2/28/94	9:42	16.2	3.5	84	12.0	-0.9	
5-s	3/1/94	11:27	15.3	3.6	80	8.5	-0.9	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
5-m	2/25/94	11:56	16.5	3.8	110	6.0	2.0	
5-m	2/25/94	15:34	16.3	3.8	140	4.0	1.6	
5-m	2/26/94	10:11	16.5	3.7	105	9.5	1.1	
5-m	2/27/94	10:55	15.9	3.9	115	9.0	0.7	
5-m	2/28/94	9:42	15.0	3.9	88	9.5	1.2	
5-m	3/1/94	11:27	13.7	4.0	80	9.0	1.3	
5-d	2/25/94	11:56	14.5	4.6	120	6.0	7.4	
5-d	2/25/94	15:34	15.0	4.5	150	5.0	6.7	
5-d	2/26/94	10:11	14.3	4.7	110	10.0	6.9	
5-d	2/27/94	10:55	13.8	4.7	120	9.5	5.5	
5-d	2/28/94	9:42	12.2	5.1	95	10.0	6.1	
5-d	3/1/94	11:27	10.3	6.2	11	10.0	6.1	
6-s	2/25/94	12:36	19.8	1.7	73	4.0	-0.3	
6-s	2/26/94	10:31	19.5	1.8	90	8.5	-0.1	
6-s	2/27/94	11:00	18.9	1.9	84	8.5	-1.2	
6-s	2/28/94	9:46	18.2	1.9	66	9.0	-0.9	
6-s	3/1/94	11:32	17.5	2.0	67	9.0	-0.8	
6-m	2/25/94	12:36	19.8	1.6	70	7.5	6.4	
6-m	2/26/94	10:31	19.1	1.9	90	11.0	6.7	
6-m	2/27/94	11:00	18.4	2.0	88	11.0	5.5	
6-m	2/28/94	9:46	18.0	2.0	66	11.5	5.8	
6-m	3/1/94	11:32	17.0	2.3	72	12.0	5.9	
6-d	2/25/94	12:36	19.5	1.9	76	6.5	2.1	
6-d	2/26/94	10:31	18.6	2.2	97	9.5	1.8	
6-d	2/27/94	11:00	17.8	2.3	94	9.0	1.1	
6-d	2/28/94	9:46	17.3	2.3	70	10.0	1.2	
6-d	3/1/94	11:32	16.5	2.8	80	13.0	1.4	
7-s	2/25/94	12:48	20.5	1.0	52	14.0		
7-s	2/26/94	10:34	20.3	1.1	67	15.5		
7-s	2/27/94	11:05	20.0	1.1	64	16.0		
7-s	2/28/94	9:52	20.0	0.9	42	15.0		
7-s	3/1/94	11:40	19.5	1.0	35	14.0		
7-m	2/25/94	12:48	20.7	0.8	44	7.5	3.3	
7-m	2/26/94	10:34	20.3	1.0	63	9.5	3.4	
7-m	2/27/94	11:05	20.0	0.9	61	9.0	3.0	
7-m	2/28/94	9:52	20.0	0.9	42	9.5	3.7	
7-m	3/1/94	11:40	19.7	0.9	41	9.0	3.8	
7-d	2/25/94	12:48	-	-	-	20.0		no flow
7-d	2/26/94	10:34	-	-	-	19.5		no flow
7-d	2/27/94	11:05	-	-	-	19.5		no flow
7-d	2/28/94	9:52	-	-	-	19.5		no flow
7-d	3/1/94							no flow



Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
8-s	2/25/94	12:49	20.0	1.5	67	5.0		
8-s	2/26/94	10:37	20.0	1.4	79	8.0		
8-s	2/27/94	11:15	19.9	1.4	73	8.0		
8-s	2/28/94	9:55	19.7	1.3	53	8.0		
8-s	3/1/94	11:44	19.6	1.4	50	8.0		
8-m	2/25/94	12:49	20.2	1.3	63	5.0	4.0	
8-m	2/26/94	10:37	19.8	1.6	80	9.0	3.9	
8-m	2/27/94	11:15	19.8	1.4	75	8.0	3.2	
8-m	2/28/94	9:55	19.5	1.3	54	9.5	3.8	
8-m	3/1/94	11:44	19.3	1.5	38	9.0	3.5	
8-d	2/25/94	12:49	20.2	1.3	64	6.0		
8-d	2/26/94	10:37	19.6	1.6	83	9.0		
8-d	2/27/94	11:15	19.4	1.5	78	8.0		
8-d	2/28/94	9:55	19.3	1.5	56	9.5		
8-d	3/1/94	11:44	19.3	1.5	60	9.5		
9-s	2/25/94	12:54	20.7	0.7	34	5.0		
9-s	2/26/94	10:40	20.5	0.8	52	8.0		
9-s	2/27/94	11:17	20.2	0.7	49	8.0		
9-s	2/28/94	10:00	20.2	0.7	32	8.0		
9-s	3/1/94	11:49	20.0	0.7	38	8.0		
9-m	2/25/94	12:54	20.9	0.5	24	6.5	5.1	
9-m	2/26/94	10:40	20.6	0.5	40	9.0	3.6	
9-m	2/27/94	11:17	20.3	0.4	39	9.0	4.3	
9-m	2/28/94	10:00	20.1	0.5	25	9.5	4.0	
9-m	3/1/94	11:49	19.8	0.5	32	9.5	4.5	
9-d	2/25/94	12:54	21.0	0.5	22	5.0		
9-d	2/26/94	10:40	20.5	0.6	40	9.5		
9-d	2/27/94	11:17	20.3	0.3	39	10.0		
9-d	2/28/94	10:00	20.2	0.5	24	9.5		
9-d	3/1/94	11:49	19.8	0.5	84	9.5		
10-s	2/25/94	11:45	19.7	1.9	80	6.0		
10-s	2/26/94	11:08	19.2	2.1	97	8.5		
10-s	2/27/94	11:50	18.7	1.9	84	10.0		
10-s	2/28/94	10:23	18.3	2.0	70	8.5		
10-s	3/1/94	10:55	18.0	2.0	66	8.0		
10-m	2/25/94	11:45	19.8	1.7	74	7.5	6.5	
10-m	2/26/94	11:08	19.3	1.8	87	9.0	6.0	
10-m	2/27/94	11:50	18.9	1.8	81	9.0	5.8	
10-m	2/28/94	10:23	18.2	2.8	70	9.5	6.4	
10-m	3/1/94	13:12	17.3	2.0	60	9.0		

## In situ Respiration Test Data - FE Warr FB (2-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
10-d	2/25/94	11:45	-	-	-	19.5		no flow
10-d	2/26/94	11:08	19.1	1.4	77	12.0		
10-d	2/27/94	11:50	18.0	1.8	81	9.0		
10-d	2/28/94	10:23	-	-	-	19.5		
10-d	3/1/94	10:55						
11-s	2/25/94	11:39	18.5	2.5	92	8.5		
11-s	2/25/94	15:26	18.5	2.5	125	5.0		
11-s	2/25/94	9:43	17.8	2.5	110			
11-s	2/26/94	11:05	17.5	2.7	110	8.5		
11-s	2/27/94	10:20	16.8	2.5	92	9.0		
11-s	2/27/94	11:45	16.5	2.5	91	9.0		
11-s	2/27/94	14:45	16.1	2.7	81	9.0		
11-s	2/28/94	10:19	19.3	2.7	70	12.0		
11-s	3/1/94	11:31	15.0	2.8	80	8.5		
11-m	2/25/94	11:39	18.0	2.8	100	10.0	4.4	
11-m	2/25/94	15:26	18.2	2.8	130	7.0	4.4	
11-m	2/26/94	9:43	16.3	2.8	110	10.0	3.2	
11-m	2/26/94	11:05	16.3	2.8	110	9.5	4.1	
11-m	2/27/94	11:45	14.3	3.1	105	9.5	3.7	
11-m	2/27/94	14:45	14.0	3.2	86	9.0		
11-m	2/28/94	10:19	13.3	3.2	76	10.0	4.0	
11-m	3/1/94	10:48	12.1	3.6	90	10.0	3.9	
11-d	2/25/94	11:39	13.5	3.5	120	10.0		
11-d	2/25/94	15:26	13.2	3.5	140	7.0		
11-d	2/25/94	9:43	8.4	4.3	115	9.5		
11-d	2/26/94	11:05	8.3	4.3	115	9.5		
11-d	2/27/94	10:20	6.5	4.9	110	10.0		
11-d	2/27/94	11:45	4.6	5.1	115	10.0		
11-d	2/27/94	14:45	4.1	5.4	97	9.5		
11-d	2/28/94	9:15	2.5	6.0	110	9.0	4.4	
11-d	3/1/94	10:48	2.9	6.5	86	9.5		
12-s	2/25/94	11:36	20.5	0.8	45	8.0		
12-s	2/26/94	11:01	20.2	0.8	62	8.0		
12-s	2/27/94	11:30	20.0	0.8	48	9.0		
12-s	2/28/94	10:14	19.7	0.7	35	8.0		
12-s	3/1/94	10:43	19.4	0.8	30	8.0		
12-m	2/25/94	11:36	20.4	0.9	49	9.0	1.6	
12-m	2/26/94	11:01	20.0	0.9	64	9.0	1.0	
12-m	2/27/94	11:30	20.0	0.8	49	11.0	1.1	
12-m	2/28/94	10:14	19.5	0.8	35	13.0	1.4	
12-m	3/1/94	10:43	19.2	0.9	95	9.0	1.3	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
12-d	2/25/94	11:36	20.5	0.8	44	10.0		
12-d	2/26/94	11:01	19.7	0.9	68	9.5		
12-d	2/27/94	11:30	18.4	0.7	50	10.0		
12-d	2/28/94	10:14	19.2	0.5	40	13.5		
12-d	3/1/94	10:43	18.8	1.0	52	10.0		
13-s	2/25/94	11:26	20.3	1.1	57	12.0		
13-s	2/26/94	10:52	19.7	1.2	76	8.0		
13-s	2/27/94	11:25	19.3	1.1	69	9.0		
13-s	2/28/94	10:07	19.2	1.0	45	8.5		
13-s	3/1/94	10:04	18.8	1.3	50	8.5		
13-m	2/25/94	11:26	20.2	1.0	57	10.0	4.6	
13-m	2/26/94	10:52	19.5	1.2	75	10.0	4.2	
13-m	2/27/94	11:25	19.2	1.1	65	7.0	4.2	
13-m	2/28/94	10:07	19.0	1.0	44	10.0	4.7	
13-m	3/1/94	10:34	18.5	1.3	60	9.5	4.2	
13-d	2/25/94	11:26	20.8	0.6	30	8.0		
13-d	2/26/94	10:52	20.0	0.7	52	10.0		
13-d	2/27/94	11:25	19.5	0.4	34	7.0		
13-d	2/28/94	10:07	19.2	0.5	28	10.0		
13-d	3/1/94	10:34	18.8	0.6	35	10.0		
14-s	2/25/94	11:15	19.8	1.6	86	9.0		
14-s	2/26/94	10:45	19.7	1.7	87	8.5		
14-s	2/27/94	11:20	19.5	1.4	79	8.0		
14-s	2/28/94	10:04	19.2	1.5	45	9.0		
14-s	3/1/94	9:59	19.3	1.3	80	9.0		
14-m	2/25/94	11:15	19.0	1.3	66	11.0	5.2	
14-m	2/26/94	10:45	19.5	1.5	85	9.0	4.4	
14-m	2/27/94	11:20	19.2	1.4	77	9.0		
14-m	2/28/94	10:04	19.0	1.3	50	10.0	4.9	
14-m	3/1/94	9:59	18.9	1.3	60	9.5	4.7	
14-d	2/25/94	11:15	20.5	0.8	42	11.0		
14-d	2/26/94	10:45	19.7	1.1	60	10.0		
14-d	2/27/94	11:20	19.2	1.0	69	9.0		
14-d	2/28/94	10:04	19.0	1.1	44	10.0		
14-d	3/1/94	9:59	18.8	1.2	60	10.0		

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
15-s	2/25/94	10:37	20.5	0.8	60	18.0		low flow
15-s	2/26/94	11:11	20.5	0.8	60	17.0		low flow
15-s	2/27/94	11:55	-	-	-	19.0		no flow
15-s	2/28/94	10:40	20.5	0.7	40.0	15.0		
15-s	3/1/94	9:10	20.0	0.5	22.0	14.5		
15-m	2/25/94	10:37	20.6	0.8	55	9.0	4.2	
15-m	2/26/94	11:11	20.5	0.7	55	9.5	3.1	
15-m	2/27/94	11:55	20.4	0.5	45	9.0		
15-m	2/28/94	10:40	20.5	0.6	39	9.0	3.5	
15-m	3/1/94	9:10	20.0	0.5	30	8.5	3.4	
15-d	2/25/94	10:37	-	-	-	19.5	-	no flow
15-d	2/26/94	11:11	-	-	-	19.5	-	no flow
15-d	2/27/94	11:55	-	-	-	20.0	-	no flow
15-d	2/28/94	10:40	-	-	-	20.0	-	no flow
15-d	3/1/94							no flow
16-s	2/25/94	10:50	20.5	0.8	56	8.0		
16-s	2/26/94	11:20	20.4	0.8	60	8.0		
16-s	2/27/94	12:00	20.3	0.6	47	8.0		
16-s	2/28/94	10:45	20.0	0.7	40	8.0		
16-s	3/1/94	9:13	19.8	0.6	36	8.0		
16-m	2/25/94	10:50	20.6	0.7	48	9.0	6.1	
16-m	2/26/94	11:20	20.5	0.7	50	9.0	5.5	
16-m	2/27/94	12:00	20.3	0.4	46	9.0	5.2	
16-m	2/28/94	10:45	20.0	0.5	30	9.0	5.9	
16-m	3/1/94	9:13	20.2	0.5	20	8.5	5.5	
16-d	2/25/94	10:50	21.0	0.4	30	9.0		
16-d	2/26/94	11:20	20.6	0.5	26	9.5		
16-d	2/27/94	12:00	20.5	0.4	28	10.0		
16-d	2/28/94	10:45	20.5	0.4	20	10.0		
16-d	3/1/94	9:13	20.2	0.4	30	9.5		
17-s	2/25/94	10:54	20.3	1.0	73	9.0		
17-s	2/26/94	11:29	20.0	1.1	70	8.0		
17-s	2/27/94	12:10	20.0	1.1	64	10.0		
17-s	2/28/94	10:48	19.8	0.9	42	8.0		
17-s	3/1/94	9:20	19.7	0.8	40	8.0		
17-m	2/25/94	10:54	20.6	0.7	50	8.0	5.1	
17-m	2/26/94	11:29	20.3	0.8	51	9.0	4.7	
17-m	2/27/94	12:10	20.0	0.8	51	9.0	5.1	
17-m	2/28/94	10:48	19.8	0.7	36	9.0	5.0	
17-m	3/1/94	9:20	19.7	0.7	30	9.0	9.7	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
17-d	2/25/94	10:54	21.0	0.4	26	8.0		
17-d	2/26/94	11:29	20.5	0.5	30	9.0		
17-d	2/27/94	12:10	20.2	0.5	35	10.0		
17-d	2/28/94	10:48	19.7	0.5	24	9.5		
17-d	3/1/94	9:20	19.6	0.5	30	10.0		
18-s	2/25/94	10:58	19.2	2.3	110	10.0		
18-s	2/26/94	11:33	19.0	2.3	105	9.5		
18-s	2/27/94	12:11	18.9	2.3	85	9.5		
18-s	2/28/94	10:52	18.5	2.0	65	10.0		
18-s	3/1/94	9:24	18.7	1.7	10	10.0		
18-m	2/25/94	10:58	19.5	2.0	100	10.0	6.1	
18-m	2/26/94	11:33	18.8	2.2	100	9.5	5.3	
18-m	2/27/94	12:11	18.6	2.2	90	9.0	5.6	
18-m	2/28/94	10:52	18.0	2.2	70	9.5	5.7	
18-m	3/1/94	9:24	18.5	1.8	68	10.0	3.2	
18-d	2/25/94	10:58	20.0	1.3	80	10.0		
18-d	2/26/94	11:33	19.0	1.6	86	9.5		
18-d	2/27/94	12:11	18.5	1.6	63	9.5		
18-d	2/28/94	10:52	18.2	1.6	60	9.5		
18-d	3/1/94	9:24	18.4	1.5	63	9.5		
19-s	2/25/94	11:02	20.3	0.9	70	8.0		
19-s	2/26/94	11:35	19.7	1.0	64	7.0		
19-s	2/27/94	12:14	19.0	1.0	67	8.0		
19-s	2/28/94	10:54	18.8	0.9	43	9.5		
19-s	3/1/94	9:30	18.9	0.9	10	8.0		
19-m	2/25/94	11:02	20.5	0.8	60	13.0	6.3	
19-m	2/26/94	11:35	-	-	-	18.5	5.3	no flow
19-m	2/27/94	12:14	-	-	-	11.0	5.8	no flow
19-m	2/28/94	10:54	18.5	1.0	43	19.5	6.0	
19-m	3/1/94	9:30	18.8	0.9	60	16.5	5.7	
19-d	2/25/94	11:02	20.8	0.5	30	9.5		
19-d	2/26/94	11:35	20.8	0.7	46	9.0		
19-d	2/27/94	12:14	19.2	0.6	54	9.0		
19-d	2/28/94	10:54	18.5	0.7	33	9.5		
19-d	3/1/94	9:30	18.6	0.8	24	9.5		
20-s	2/25/94	10:29	20.5	0.7	44	8.0		
20-s	2/26/94	12:03	20.5	0.7	46	8.0		
20-s	2/27/94	13:31	20.4	0.5	35	8.0		
20-s	2/28/94	11:21	20.3	0.5	30	8.0		
20-s	3/1/94	9:06	20.3	0.5	20	8.0		

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
20-m	2/25/94	10:29	20.5	0.6	30	17.0	4.3	low flow
20-m	2/26/94	12:03	20.5	0.6	32	16.0	3.7	
20-m	2/27/94	13:31	20.5	0.6	22	19.0	3.8	
20-m	2/28/94	11:21	20.5	0.4	20	19.0	3.8	
20-m	3/1/94	9:06	20.2	0.3	20	10.5	3.7	
20-d	2/25/94	10:29	21.0	0.5	20			
20-d	2/26/94	12:03	20.7	0.5	24	9.0		
20-d	2/27/94	13:31	20.7	0.3	17	9.0		
20-d	2/28/94	11:21	20.5	0.3	14	9.0		
20-d	3/1/94	9:06	20.2	0.2	10	9.5		
21-s	2/25/94	10:19	20.5	0.7	40	8.5		
21-s	2/26/94	11:57	20.0	0.5	34	8.5		
21-s	2/27/94	13:26	20.5	0.5	33	7.0		
21-s	2/28/94	11:17	20.1	0.5	26	8.0		
21-s	3/1/94	9:01	20.2	0.3	40	8.5		
21-m	2/25/94	10:19	20.8	0.5	25	13.0	3.1	
21-m	2/26/94	11:57	20.6	0.5	32	11.0	2.3	
21-m	2/27/94	13:26	20.8	0.4	25	9.0	2.8	
21-m	2/28/94	11:17	20.5	0.3	18	11.0	3.0	
21-m	3/1/94	9:01	20.3	0.3	25	11.0	2.6	
21-d	2/25/94	10:19	21.0	0.3	15			
21-d	2/26/94	11:57	20.8	0.4	14	9.5		
21-d	2/27/94	13:26	20.9	0.3	10	9.0		
21-d	2/28/94	11:17	20.7	0.1	6	9.5		
21-d	3/1/94	9:01	20.5	0.1	10	10.0		
22-s	2/25/94	10:16	20.5	0.7	40	8.5		
22-s	2/26/94	11:50	20.3	0.8	44	8.0		
22-s	2/27/94	13:21	20.1	0.8	42	8.0		
22-s	2/28/94	11:12	20.0	0.7	35	7.5		
22-s	3/1/94	8:57	20.2	0.7	36	8.0		
22-m	2/25/94	10:16	20.8	0.5	25	9.5	4.1	temp not reading
22-m	2/26/94	11:50	20.5	0.6	30	9.0		
22-m	2/27/94	13:21	20.4	0.5	27	9.0	-	
22-m	2/28/94	11:12	20.2	0.5	24	9.0	-	
22-m	3/1/94	8:57	20.0	0.5	28	9.5		
22-d	2/25/94	10:16	21.0	0.3	15	10.5		
22-d	2/26/94	11:50	20.8	0.4	22.0	10.0		
22-d	2/27/94	13:21	20.8	0.2	13.0	10.0		
22-d	2/28/94	11:12	20.3	0.4	15.0	10.0		
22-d	3/1/94	8:57	20.3	0.4	25.0	12.5		

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
23-s	2/25/94	10:09	20.8	0.6	30	8.5		
23-s	2/26/94	11:46	20.3	0.7	40	8.5		
23-s	2/27/94	13:17	20.0	0.6	33	8.5		
23-s	2/28/94	11:07	19.7	0.5	30	8.0		
23-s	3/1/94	8:55	20.3	0.5	30	5.0		
23-m	2/25/94	10:09	21.0	0.4	20	13.0	4.1	
23-m	2/26/94	11:46	20.6	0.5	33	12.5	3.1	
23-m	2/27/94	13:17	20.4	0.4	20	11.5	3.4	
23-m	2/28/94	11:07	20.0	0.3	22	12.5	3.3	
23-m	3/1/94	8:55	20.2	0.3	36	13.0	3.4	
23-d	2/25/94	10:09	21.0	0.4	20	9.5		
23-d	2/26/94	11:46	20.6	0.4	25	10.0		
23-d	2/27/94	13:17	20.5	0.4	20	10.0		
23-d	2/28/94	11:07	20.0	0.3	20	9.0		
23-d	3/1/94	8:55	20.3	0.3	26	26.0	10.0	
24-s	2/25/94	9:59	20.3	1.0	60	8.5		
24-s	2/26/94	11:40	20.0	1.0	67	8.0		
24-s	2/27/94	11:13	20.0	1.0	52	9.0		
24-s	2/28/94	11:03	19.5	0.8	40	8.0		
24-s	3/1/94	8:52	19.6	1.0	47	10.0		
24-m	2/25/94	9:59	20.3	1.0	70	10.0	6.1	
24-m	2/26/94	11:40	20.0	0.9	68	9.0	4.9	
24-m	2/27/94	11:13	20.0	0.9	50	9.0	5.1	
24-m	2/28/94	11:03	19.2	0.9	40	13.0	5.1	
24-m	3/1/94	8:52	18.9	0.8	47	9.5	4.8	
24-d	2/25/94	9:59	20.5	0.8	40	9.5		
24-d	2/26/94	11:40	20.2	0.8	58	9.0		
24-d	2/27/94	11:13	20.0	0.8	44	9.5		
24-d	2/28/94	11:03	19.4	0.7	36	9.0		
24-d	3/1/94	8:52	19.8	0.7	40	9.5		
25-s	2/25/94	9:26	20.1	1.1	62	9.0		
25-s	2/26/94	13:30	20.0	1.1	66	9.0		
25-s	2/27/94	13:36	20.0	1.0	60	10.0		
25-s	2/28/94	11:26	20.0	0.8	46	8.5		
25-s	3/1/94	8:08	19.8	1.0	48	9.0		
25-m	2/25/94	9:26	20.5	0.7	40	18.0	5.5	low flow
25-m	2/26/94	13:30	20.5	0.7	38	17.5	4.9	low flow
25-m	2/27/94	13:36	20.4	0.7	35	17.0	5.0	
25-m	2/28/94	11:26	20.6	0.4	25	16.0	4.8	
25-m	3/1/94	8:08	20.2	0.5	30	18.0	5.0	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
25-d	2/25/94	9:26	20.8	0.5	20	10.0		
25-d	2/26/94	13:30	20.6	0.5	36	10.0		
25-d	2/27/94	13:36	20.8	0.3	24	10.0		
25-d	2/28/94	11:26	20.8	0.2	14	9.5		
25-d	3/1/94	8:08	20.2	0.3	20	10.0		
26-s	2/25/94	9:34	-	-	-	19.0	-	no flow
26-s	2/26/94	13:34	-	-	-	19.0	-	no flow
26-s	2/27/94	13:42	20.3	0.8	47	18.0		
26-s	2/28/94	11:30	20.0	0.7	35	18.0		
26-s	3/1/94	8:12	19.6	0.8	40	18.0		
26-m	2/25/94	9:34	20.6	0.6	34	10.0	5.2	
26-m	2/26/94	13:34	20.5	0.6	40	10.0	4.5	
26-m	2/27/94	13:42	20.4	0.5	24	10.0	4.9	
26-m	2/28/94	11:30	20.5	0.2	14	9.5	4.6	
26-m	3/1/94	8:12	19.5	0.5	20	9.5	4.6	
26-d	2/25/94	9:34	20.8	0.4	27	10.0		
26-d	2/26/94	13:34	20.5	0.5	34	9.5		
26-d	2/27/94	13:42	20.4	0.4	23	10.0		
26-d	2/28/94	11:30	20.6	0.2	10	9.5		
26-d	3/1/94	8:12	19.8	0.4	20	9.5		
27-s	2/25/94	9:42	20.0	1.6	74	10.0		
27-s	2/26/94	13:37	19.5	1.6	80	10.0		
27-s	2/27/94	13:48	19.2	1.4	65	9.0		
27-s	2/28/94	11:44	19.0	1.1	60	10.0		
27-s	3/1/94	8:16	18.4	1.3	50	10.5		
27-m	2/25/94	9:42	20.1	1.2	63	9.0	4.8	
27-m	2/26/94	13:37	19.3	1.3	75	9.5	3.5	
27-m	2/27/94	13:48	18.7	1.4	60	9.0	4.0	
27-m	2/28/94	11:44	18.6	1.2	60	9.5	4.1	
27-m	3/1/94	8:16	17.8	1.3	50	9.0	3.7	
27-d	2/25/94	9:42	20.5	0.5	32	10.0		
27-d	2/26/94	13:37	19.7	0.7	50	10.0		
27-d	2/27/94	13:48	19.1	0.8	45	10.0		
27-d	2/28/94	11:44	19.2	0.7	43	10.0		
27-d	3/1/94	8:16	18.7	0.9	40	9.5		



Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
28-s	2/25/94	9:47	17.3	2.3	110	8.5		
28-s	2/25/94	15:13	17.0	3.2	140	6.0		
28-s	2/26/94	9:29	15.0	4.0	140	9.0		
28-s	2/26/94	13:40	14.7	4.0	130	8.5		
28-s	2/27/94	9:40	14.1	4.2	115	9.0		
28-s	2/27/94	13:55	14.0	4.0	110			
28-s	2/28/94	11:47	13.8	3.7	96	8.0		
28-s	3/1/94	8:20	13.7	4.1	84	8.0		
28-m	2/25/94	9:47	16.2	4.2	110	9.0	7.6	
28-m	2/25/94	15:13	16.3	3.9	150	5.5	7.1	
28-m	2/26/94	9:29	15.3	4.2	140	9.5	6.3	
28-m	2/26/94	13:40	14.9	4.2	120	9.0	6.6	
28-m	2/27/94	9:40	14.6	4.2	120	9.0	6.7	
28-m	2/27/94	13:55	14.7	4.2	100	10.0	6.5	
28-m	2/28/94	11:47	14.5	3.5	92	9.0	6.8	
28-m	3/1/94	8:20	14.2	4.2	85	9.0	6.6	
28-d	2/25/94	9:47	17.8	2.3	90	13.0		
28-d	2/26/94	9:29	-	-	-	19.0	-	no flow
28-d	2/26/94	13:40	-	-	-	19.5	-	no flow
28-d	2/27/94	9:40	-	-	-	19.0	-	no flow
28-d	2/27/94	13:55	-	-	-	19.0	-	no flow
28-d	2/28/94	11:47	-	-	-	19.0	-	no flow
28-d	3/1/94	11:47						no flow
29-s	2/25/94	9:49	-	-	-	20.0	-	no flow
29-s	2/26/94	9:34	-	-	-	19.0	-	no flow
29-s	2/26/94	13:43	-	-	-	19.0	-	no flow
29-s	2/27/94	9:47	18.8	1.3	74	17.0		low flow
29-s	2/27/94	14:12	18.8	1.3	60	10.0		
29-s	2/28/94	11:51	18.0	1.3	60	8.0		
29-s	3/1/94	8:24	18.2	1.4	60	9.0		
29-m	2/25/94	9:49	18.3	1.9	80	9.5	5.4	
29-m	2/25/94	15:17	19.3	1.8	110	5.0	5.1	
29-m	2/26/94	9:34	18.0	1.9	94	9.0	5.0	
29-m	2/26/94	13:43	17.4	2.0	92	9.5	4.6	
29-m	2/27/94	9:47	16.8	2.0	86	9.0		
29-m	2/27/94	14:12	16.2	2.0	72	10.0	4.5	
29-m	2/28/94	11:51	15.6	2.0	74	9.0	4.9	
29-m	3/1/94	8:24	16.7	2.2	74	9.5	4.7	

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
29-d	2/25/94	9:49	20.3	0.7	33	10.0		
29-d	2/25/94	15:17	20.2	0.7	60	6.0		
29-d	2/26/94	9:34	17.5	1.8	95	10.0		
29-d	2/26/94	13:43	17.0	2.0	92	9.5		
29-d	2/27/94	9:47	16.0	2.5	94	9.0		
29-d	2/27/94	14:12	15.8	2.5	80	11.0		
29-d	2/28/94	11:51	14.5	2.8	84	9.5		
29-d	3/1/94	8:24	15.8	3.0	84	10.0		
30-s	2/25/94	9:15	20.5	1.0	80	11.0		
30-s	2/26/94	14:09	20.5	1.0	55	8.0		
30-s	2/27/94	14:36	20.5	1.0	42	8.0		
30-s	2/28/94	11:56	20.7	0.7	37	8.5		
30-s	3/1/94	8:05	20.5	0.7	36	9.0		
30-m	2/25/94	9:15	20.5	1.0	80	17.0	1.9	
30-m	2/26/94	14:09	20.6	1.0	54	17.0	1.9	low flow
30-m	2/27/94	14:36	20.6	1.0	44	16.5	2.7	
30-m	2/28/94	11:56	20.7	0.7	40	17.0	2.8	
30-m	3/1/94	8:05	20.4	0.7	38	17.0	2.6	
30-d	2/25/94	9:15	20.5	1.0	80	10.0		
30-d	2/26/94	14:09	20.5	1.0	56	9.5		
30-d	2/27/94	14:36	20.6	1.0	50	10.0		
30-d	2/28/94	11:56	20.8	0.6	37	11.0		
30-d	3/1/94	1:12	20.5	0.8	46	10.0		
31-s	2/25/94	9:09	20.8	0.7	60	8.0		
31-s	2/26/94	14:04	20.8	0.7	40	8.0		
31-s	2/27/94	14:30	21.0	0.5	23	8.0		
31-s	2/28/94	12:00	21.0	0.3	26	11.0		
31-s	3/1/94	8:00	20.3	0.5	22	8.5		
31-m	2/25/94	9:09	20.7	0.7	50	9.0	3.1	
31-m	2/26/94	14:04	20.7	0.7	44	16.0	3.7	low flow
31-m	2/27/94	14:30	20.8	0.4	27	16.0	4.0	low flow
31-m	2/28/94	12:00	21.0	0.4	25	16.0	3.8	
31-m	3/1/94	8:00	20.6	0.5	22	16.0	3.7	
31-d	2/25/94	9:09	20.7	0.9	70.0	10.0		
31-d	2/26/94	14:04	20.5	0.8	60.0	11.0		
31-d	2/27/94	14:30	20.8	0.7	37	11.0		
31-d	2/28/94	12:00	21.0	0.5	35	11.0		
31-d	3/1/94	8:00	20.7	0.6	30	11.5		

## In situ Respiration Test Data - FE Warren AFB (2-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
32-s	2/25/94	9:02	-	-	-	19.0	-	no flow
32-s	2/26/94	9:24	-	-	-	19.0	-	no flow
32-s	2/26/94	14:00	-	-	-	19.0	-	no flow
32-s	2/27/94	9:20	-	-	-	19.0	-	no flow
32-s	2/27/94	14:25	-	-	-	19.0	-	no flow
32-s	2/28/94	14:25	-	-	-	19.0	-	no flow
32-s	3/1/94	7:56	-	-	-	-	-	no flow
32-m	2/25/94	9:02	5.0	7.0	160	17.0	4.5	used 1:1 dilutor
32-m	2/25/94	15:04	7.0	8.5	150	16.0	6.5	used 1:1 dilutor
32-m	2/25/94	16:21	6.4	9.0	150	16.0		used 1:1 dilutor
32-m	2/25/94	16:42	6.4	9.0	155			used 1:1 dilutor
32-m	2/26/94	9:24	6.7	9.5	160	16.0	4.4	used 1:1 dilutor
32-m	2/26/94	14:00	6.6	9.5	130	16.5	4.5	used 1:1 dilutor
32-m	2/27/94	9:20	8.2	8.9	105	16.5	5.4	used 1:1 dilutor
32-m	2/27/94	14:25	8.0	9.3	110	16.0	5.6	used 1:1 dilutor
32-m	2/28/94	14:25	7.0	9.0	140	17.0	4.9	used 1:1 dilutor
32-m	3/1/94	7:56	7.8	9.0	120	17.0	5.1	
32-d	2/25/94	9:02	0.0	12.0	1,000	11.0		HC odor
32-d	2/26/94	9:24	0.0	12.0	1,800	10.0		HC odor
32-d	2/28/94	14:25	0.0	12.5	1,200	9.5		
32-d	3/1/94	12:15	0.0	12.5	1,200	9.5		
33-s	2/25/94	8:55	18.3	2.8	125	9.0		
33-s	2/25/94	15:06	18.5	2.5	130	6.0		
33-s	2/26/94	9:19	16.6	3.0	120	8.0		
33-s	2/26/94	13:56	16.5	3.0	110	8.0		
33-s	2/27/94	9:25	16.1	3.1	105	8.5		
33-s	2/27/94	14:22	16.0	3.1	85	9.0		
33-s	2/28/94	12:10	16.2	2.7	100	8.0		
33-s	3/1/94	7:53	15.0	3.6	94	9.0		
33-m	2/25/94	8:55	-	-	-	19.0	5.8	no flow
33-m	2/26/94	9:19	14.5	4.4	130	11.0	5.7	
33-m	2/26/94	13:56	14.3	4.3	120	11.0	5.8	
33-m	2/27/94	9:25	14.4	4.4	120	9.0	6.5	
33-m	2/27/94	14:22	14.0	4.6	94	11.0	6.2	
33-m	2/28/94	12:10	14.5	3.7	120	11.0	6.1	
33-m	3/1/94	7:53	13.7	4.8	100	11.0	6.1	
33-d	2/25/94	8:55	0.0	13.0	800	11.5		HC odor
33-d	2/26/94	9:19	0.0	12.5	800			
33-d	2/28/94	12:10	0.0	13.0	600	11.0		
33-d	2/28/94							
33-d	3/1/94	7:53	0.0	12.5	600	11.5		

## In situ Respiration Test Data - FE Warren AFB (2-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
34-s	2/25/94	8:50	-	-	-	19.5		no flow
34-s	2/25/94	15:09	-	-	-	19.0		no flow
34-s	2/26/94	9:15	-	-	-	19.0		no flow
34-s	2/26/94	13:51	19.3	1.1	60.0	9.0		
34-s	2/27/94	9:30	19.0	1.0	63	9.0		
34-s	2/27/94	14:17	18.7	1.1	55			
34-s	2/28/94	12:06	18.0	1.0	70	9.0		
34-s	3/1/94	7:48	15.5	2.0	76	9.5	7.2	
34-m	2/25/94	8:50	20.3	1.0	70	10.0	7.2	
34-m	2/25/94	15:09	20.3	1.0	80	6.0	7.6	
34-m	2/25/94		20.2	1.0	72	9.5		
34-m	2/26/94	9:15	19.1	1.3	71	9.0	6.3	
34-m	2/26/94	13:51	18.8	1.3	72	9.5	6.9	
34-m	2/27/94	9:30	18.2	1.3	73	9.5	7.2	
34-m	2/27/94	14:17	18.0	1.4	62	11.0	7.3	
34-m	2/28/94	12:06	17.3	1.3	80	9.5	7.1	
34-m	3/1/94	7:48	16.5	1.5	55	9.0		
34-d	2/25/94	8:50	20.0	1.0	80	10.0		
34-d	2/25/94	15:09	19.0	1.0	80	6.0		
34-d	2/26/94	9:15	18.7	1.3	74	9.0		
34-d	2/26/94	13:51	18.0	1.5	75	9.5		
34-d	2/27/94	9:30	17.5	1.4	72	9.0		
34-d	2/27/94	14:17	16.8	1.7	65	11.0		
34-d	2/28/94	12:06	15.5	1.9	87	9.0		
34-d	3/1/94	7:48	13.5	2.5	84	9.5		

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
1-s	7/7/94	17:20	13.5	7.0	190	9.0	23.8	
1-s	7/8/94	13:23	13.8	6.5				
1-s	7/9/94	16:41	13.8	6.5				
1-s	7/10/94	12:36	18.5	2.2				
1-s	7/12/94	10:55	16.5	4.8			23.4	
1-m	7/7/94	17:20	6.5	13.0	170	9.0	19.1	
1-m	7/8/94	13:24	7.0	11.8				
1-m	7/9/94	16:42	7.2	11.5				
1-m	7/10/94	12:37	15.2	4.8				
1-m	7/12/94	10:56	11.0	9.3			19.0	
1-d	7/7/94	17:20	4.5	14.0	180	10.0	13.2	
1-d	7/8/94	13:25	5.0	12.5				
1-d	7/9/94	16:40	5.8	11.9				
1-d	7/10/94	12:38	12.2	6.1				
1-d	7/12/94	10:59	9.0	11.8			13.1	
2-s	7/7/94	17:25	17.8	3.8	160	7.5	23.4	
2-s	7/8/94	13:18	18.2	3.0				
2-s	7/9/94	16:45	18.3	2.9				
2-s	7/10/94	12:32	15.9	4.9				
2-s	7/11/94	10:21	18.2	2.5				
2-s	7/12/94	10:47	18	2.8		7.0	23.0	
2-m	7/7/94	17:25	16.2	4.8	160	9.0		No t/c head
2-m	7/8/94	13:19	16.1	4.5				
2-m	7/9/94	16:45	16.8	4.1				
2-m	7/10/94	12:32	9.8	10.5				
2-m	7/11/94	10:22	15.1	4.8				
2-m	7/12/94	10:48	14.1	5.0		6.5		
2-d	7/7/94	17:25	15.0	5.8	160	9.0	14.0	
2-d	7/8/94	13:20	15.0	5.0				
2-d	7/9/94	16:46	14.9	4.9				
2-d	7/10/94	12:33	7.1	12.0				
2-d	7/11/94	10:22	12.9	5.5				
2-d	7/12/94	10:49	12.3	5.8		7.0	14.3	
3-s	7/7/94	17:30	18.0	3.0	120	7.0	25.0	
3-s	7/8/94	13:12	17.1	2.2				
3-s	7/8/94	16:54	16.8	3.5				
3-s	7/9/94	16:02	15	3.8				
3-s	7/12/94	10:42	11	5.0		7.0	24.7	
3-m	7/7/94	13:13	17.5	3.5	110	6.0	18.3	
3-m	7/8/94	16:55	16.9	3.3				
3-m	7/9/94	16:03	14.9	3.8				
3-m	7/12/94	10:43	11.0	5.0		6.0	18.3	
3-d	7/7/94	17:30	17.2	3.5	130	6.5		
3-d	7/8/94	13:15	17.0	3.0				
3-d	7/8/94	16:56	17.0	3.1				
3-d	7/9/94	16:05	15.8	3.1				
3-d	7/12/94	10:43	12.8	4.1		6.5		

In situ Respiration Data - FE Warren A (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
4-s	7/7/94	17:40	17.0	4.0	150	6.5	23.8	
4-s	7/8/94	13:07	16	4.0				
4-s	7/8/94	16:59	16.1	4.0				
4-s	7/9/94	8:56	14.6	4.8				
4-s	7/10/94	16:07	13.6	4.8				
4-s	7/11/94	10:25	10.1	6.1				
4-s	7/12/94	10:38	7.5	7.0		6.0	23.5	
4-s	7/13/94	7:55	6.5	7.9		6.0	24.1	
4-m	7/7/94	17:40	17.0	3.8	150	12.0	14.8	
4-m	7/8/94	13:09	17.0	3.6				
4-m	7/8/94	16:60	16.5	3.6				
4-m	7/9/94	8:57	14.8	4.0				
4-m	7/10/94	16:08	13.3	3.9				
4-m	7/11/94	10:26	8.1	5.8				
4-m	7/12/94	10:39	5.5	6.8		7.5	15.4	
4-m	7/13/94	7:56	4.5	7.5		7.0	16.2	
4-d	7/7/94	17:40	18.8	2.2	110	7.0	19.8	
4-d	7/8/94	13:10	17.9	1.7				
4-d	7/8/94	17:01	17.1	2.8				
4-d	7/9/94	8:58	14.1	3.5				
4-d	7/10/94	16:09	12.8	3.5				
4-d	7/11/94	10:26	6.5	5.0				
4-d	7/12/94	10:35	4.0	6.2		7.0	19.7	
4-d	7/13/94	7:57	3.0	7.3		6.0	20.5	

5-s	7/7/94	17:50	20.0	1.8	105	6.0	24.6	
5-s	7/8/94	17:06	19.5	1.5				
5-s	7/9/94	15:53	20.0	0.8				
5-s	7/9/94	20:09	20.0	0.8				
5-s	7/10/94	12:26	19.9	0.8				
5-s	7/12/94	11:06	20.0	0.8		2.0	24.8	
5-s	7/13/94	8:05	20.5	0.8		2.0	24.7	
5-m	7/7/94	17:50	8.2	10.5	170	10.0	22.2	
5-m	7/8/94	17:07	8.1	9.3				
5-m	7/9/94	15:54	7.0	9.5				
5-m	7/9/94	7/3/09	7.1	10.0				
5-m	7/10/94	12:27	7.5	9.8				
5-m	7/12/94	11:07	8.0	9.7				
5-m	7/13/94	8:06	7.0	11.1				
5-d	7/7/94	17:50	7.0	10.5				
5-d	7/8/94	17:07	4.9	10.5				
5-d	7/9/94	15:55	2.6	11.9				
5-d	7/9/94	20:12	2.3	13.5				
5-d	7/10/94	12:28	2.1	13.5				
5-d	7/12/94	11:08	2.8	13.0		6.0	22.3	
5-d	7/13/94	8:07	1.8	11.5		2.0	22.5	
6-s	7/7/94	18:00	18.5	2.9	140	10.0	24.0	
6-s	7/8/94	17:10	18.5	2.3				
6-s	7/9/94	15:45	17.9	2.5				
6-s	7/12/94	11:14	16.3	2.9		6.0	24.0	
6-s	7/13/94	8:12	16.0	3.7		5.0	23.8	

## In situ Respiration Data - FE Warren A (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
6-m	7/7/94	18:00	18.5	2.8	140	11.0	15.4	
6-m	7/8/94	17:11	17.1	1.9				
6-m	7/9/94	15:51	17.8	2.2				
6-m	7/12/94	11:15	12.2	4.8		4.0	15.9	
6-m	7/13/94	8:14	11.2	5.8		5.0	15.3	
6-d	7/7/94	18:00	18.0	2.9	140	9.0	21.1	
6-d	7/8/94	17:12	17.0	2.9				
6-d	7/9/94	15:50	14.8	3.5				
6-d	7/12/94	11:16	11.0	4.8		6.0	21.3	
6-d	7/13/94	8:16	10.0	6.0		2.0	21.2	

7-s	7/7/94	18:04	19.5	2.6	130	17.0		
7-s	7/8/94	17:14	18.8	2.1				
7-s	7/9/94	15:39	17.9	2.5				
7-s	7/12/94	13:01	17.9	2.8		10.0		
7-m	7/7/94	18:04	20.0	1.2	100	6.5	18.5	
7-m	7/8/94	17:16	19.1	1.8				
7-m	7/9/94	15:41	18.1	1.8				
7-m	7/12/94	13:02	17.0	2.9		5.0	17.5	
7-d	7/7/94	18:04	20.5	0.9	70	10.0		
7-d	7/8/94	17:17	19.5	1.1				
7-d	7/9/94	15:42	18.5	1.3				
7-d	7/12/94	13:03	17.5	1.8		5.0		

8-s	7/7/94	18:10	15.0	7.2	180	9.0		
8-s	7/8/94	17:18	15	6.8				
8-s	7/9/94	15:36	15.5	6.2				
8-s	7/12/94	12:57	16.1	5.2		5.0		
8-m	7/7/94	18:10	15.2	6.0	165	6.5	19.7	
8-m	7/8/94	17:19	13.9	6.9				
8-m	7/9/94	15:37	15.3	6.3				
8-m	7/12/94	12:58	14.0	7.0		6.0	19.5	
8-d	7/7/94	18:10	14.5	6.9	170	10.0		
8-d	7/8/94	17:20	14.2	6.2				
8-d	7/9/94	15:37	13.9	6.5				
8-d	7/12/94	12:59	14.0	6.8		3.0		

9-s	7/7/94	18:20	19.0	2.8	130	9.0		
9-s	7/8/94	17:20	18.5	1.8				
9-s	7/9/94	9:02	18.5	2.5				
9-s	7/12/94	12:52	17.9	2.8		6.0		
9-m	7/7/94	18:20	19.1	1.5	94	10.0	16.3	
9-m	7/8/94	17:21	18.9	2.0				
9-m	7/9/94	9:03	18.5	1.9				
9-m	7/12/94	15:53	17.5	2.8			115.3	
9-d	7/7/94	18:20	20.0	1.5	82	10.0		
9-d	7/8/94	17:22	19.1	1.8				
9-d	7/9/94	9:04	19.0	1.5				
9-d	7/12/94	12:54	17.5	2.0		3.0		

## In situ Respiration Data - FE Warren (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
10-s	7/7/94	17:10	15.0	6.5	180	9.0		
10-s	7/8/94	12:50	15.2	5.0				
10-s	7/8/94	16:12	15.8	5.5				
10-s	7/9/94	16:44	15.7	5.5				
10-s	7/10/94	12:22	15.8	4.8				
10-s	7/12/94	13:06	15.5	5.1		5.0		
10-m	7/7/94	17:10	15.2	5.8	160	10.0	17.1	
10-m	7/8/94	12:52	15.2	4.8				
10-m	7/8/94	16:13	15.8	5.0				
10-m	7/9/94	16:46	14.5	5.1				
10-m	7/10/94	12:23	14.1	5.5				
10-m	7/12/94	13:06	13.5	6.5		3.0	16.6	
10-d	7/7/94	17:10	15.5	4.8	160	10.0		
10-d	7/8/94	12:52	15.8	4.0				
10-d	7/8/94	16:14	15.8	4.1				
10-d	7/9/94	16:47	11.3	6.5				
10-d	7/10/94	12:24	13.5	5.0				
10-d	7/12/94	13:06	12.9	5.9		2.0		
11-s	7/7/94	16:57	13.0	6.8	160	8.0		
11-s	7/8/94	12:55	11.0	7.5				
11-s	7/8/94	16:18	15.2	4.5				
11-s	7/9/94	16:28	16.5	3.8				
11-s	7/9/94	20:14	16.8	3.8				
11-s	7/10/94	12:18	16.8	3.5				
11-s	7/12/94	10:34	16.0	3.8		7.0		
11-m	7/7/94	16:57	12.0	7.8	160	9.0	19.9	
11-m	7/8/94	12:56	12.0	6.5				
11-m	7/8/94	16:17	12.1	6.8				
11-m	7/9/94	16:29	10.3	7.1				
11-m	7/9/94	20:15	10.2	7.8				
11-m	7/10/94	12:19	9.8	7.5				
11-m	7/12/94	10:34	8.0	9.0		6.5	20.1	
11-d	7/7/94	16:57	11.5	5.8	150	9.0		
11-d	7/8/94	12:57	11.0	5.0				
11-d	7/8/94	16:18	9.9	6.0				
11-d	7/9/94	16:30	3.0	7.8				
11-d	7/9/94	20:16	2.8	8.8				
11-d	7/10/94	12:20	1.0	8.8				
12-s	7/7/94	16:58	19.2	2.0	130	9.0		
12-s	7/8/94	12:59	19.8	0.8				
12-s	7/8/94	16:20	19.2	1.8				
12-s	7/9/94	16:34	20.5	0.9				
12-s	7/12/94	10:29	19.8	1.5		5.0		
12-m	7/7/94	16:58	17.5	2.5	140	10.0	20.8	
12-m	7/8/94	13:00	17.5	3.0				
12-m	7/8/94	16:21	17.8	3.2				
12-m	7/9/94	16:35	16.5	3.2				
12-m	7/12/94	10:29	14.9	3.8		7.0	21.0	



## In situ Respiration Data - FE Warren (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
12-d	7/7/94	16:58	18.2	2.8	115	10.0		
12-d	7/8/94	13:02	18.3	2.5				
12-d	7/8/94	16:22	17.9	2.8				
12-d	7/9/94	16:37	16.5	2.8				
12-d	7/12/94	10:29	14.0	3.8		7.0		

13-s	7/7/94	16:53	12.5	8.9	180	7.0		
13-s	7/8/94	16:24	12.1	8.8				
13-s	7/10/94	12:13	8.1	9.8				
13-s	7/11/94	10:16	7.0	10.8				
13-s	7/12/94	10:19	6.0	10.0		5.0		
13-s	7/13/94	8:31	6.0	11.9		5.0		
13-m	7/7/94	16:53	14.0	7.0	170	9.0	20.1	
13-m	7/8/94	16:24	14.0	6.3				
13-m	7/10/94	12:14	8.2	7.9				
13-m	7/11/94	10:17	6.8	8.9				
13-m	7/12/94	10:20	5.0	9.8			21.3	
13-m	7/13/94	8:33	4.3	11.0		4.0	21.6	
13-d	7/7/94	16:53	19.2	1.9	105	10.0		
13-d	7/8/94	16:25	18.8	1.9				
13-d	7/10/94	12:15	13.5	1.8				
13-d	7/11/94	10:18	11.1	2.8				
13-d	7/12/94	10:21	8.5	2.9				
13-d	7/13/94	8:35	7.0	3.8		5.0		

14-s	7/7/94	18:15	17.5	4.5	165	10.0		
14-s	7/8/94	16:28	17.2	3.8				
14-s	7/9/94	17:13	17.0	3.8				
14-s	7/12/94	10:15	16.2	3.9		7.0		
14-m	7/7/94	18:15	18.2	3.8	140	10.0	16.0	
14-m	7/8/94	16:29	17.0	3.8				
14-m	7/9/94	17:14	16.2	3.8				
14-m	7/12/94	10:16	15.0	4.5		7.0	16.6	
14-d	7/7/94	18:15	19.0	2.5	115	9.0		
14-d	7/8/94	16:30	18.2	2.5				
14-d	7/9/94	17:15	16.5	2.8				
14-d	7/12/94	10:17	14.9	3.8		7.0		

15-s	7/7/94	15:10	19.2	1.8	150	10.0		
15-s	7/8/94	16:09	19	2.0				
15-s	7/9/94	16:53	19.2	1.5				
15-s	7/12/94	13:12	19.0	1.8		5.0		
15-m	7/7/94	15:10	19.0	2.2	170	10.0	17.6	
15-m	7/8/94	16:10	18.5	2.8				
15-m	7/9/94	16:54	18.0	2.8				
15-m	7/12/94	13:13	17.8	2.9		5.0	17.4	
15-d	7/7/94	15:10	19.8	1.0	140	10.0		
15-d	7/8/94	16:11	19.0	1.8				
15-d	7/9/94	16:55	18.5	1.9				
15-d	7/12/94	13:13	17.9	2.3		3.0		

## In situ Respiration Data - FE Warren (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
16-s	7/7/94	15:20	19.0	1.9	160	11.0		
16-s	7/8/94	16:06	18.5	2.5				
16-s	7/9/94	16:57	18.1	2.5				
16-s	7/12/94	13:16	17.8	2.8		6.5		
16-m	7/7/94	15:20	20.0	1.2	130	10.0	15.7	
16-m	7/8/94	16:07	19.0	1.4				
16-m	7/9/94	16:58	18.1	1.8				
16-m	7/12/94	13:12	16.8	2.8		6.0	15.7	
16-d	7/7/94	15:20	21.0	0.5	74	10.0		
16-d	7/8/94	16:08	19.9	0.9				
16-d	7/9/94	16:59	18.8	0.9				
16-d	7/12/94	13:18	17.0	1.8		9.0		
17-s	7/7/94	15:30	17.2	4.2	195	8.0		Water in well
17-s	7/8/94	16:03	16	4.8				
17-s	7/9/94	17:01	15.1	4.9				
17-s	7/12/94	10:08	13.0	6.0		6.0		
17-m	7/7/94	15:30	18.8	2.5	170	9.0	78.8	
17-m	7/8/94	16:04	17.0	3.5				
17-m	7/9/94	17:02	15.5	3.8				
17-m	7/12/94	10:09	13.3	5.2		7.0	19.4	
17-d	7/7/94	15:30	19.5	1.2	130	9.0		
17-d	7/8/94	16:05	18.5	1.8				
17-d	7/9/94	17:03	16.9	2.3				
17-d	7/12/94	10:10	14.0	3.8		7.0		
18-s	7/7/94	15:35	13.0	7.0	220	10.0		
18-s	7/8/94	16:01	12.8	6.8				
18-s	7/9/94	17:05	10.5	8.2				
18-s	7/10/94	12:08	9.2	8.8				
18-s	7/12/94	10:04	7.5	10.0		7.0		
18-s	7/13/94	7:21	8.0	9.8		7.0		
18-m	7/7/94	15:35	16.0	5.0	200	9.0	21.6	
18-m	7/8/94	16:02	13.8	5.9				
18-m	7/9/94	17:06	10.2	6.8				
18-m	7/10/94	12:09	15.9	8.8				
18-m	7/12/94	10:05	5.5	10.3		8.0	22.1	
18-m	7/13/94	7:22	6.8	11.1		5.0	23.0	
18-d	7/7/94	15:35	19.0	1.9	150	9.0		
18-d	7/8/94	16:03	17.3	2.7				
18-d	7/9/94	17:07	12.8	3.8				
18-d	7/10/94	12:09	10.5	4.5				
18-d	7/12/94	10:06	6.5	7.3		7.0		
18-d	7/13/94	7:23	7.0	7.5		4.0		
19-s	7/7/94	16:30	17.5	3.5	150	7.0		
19-s	7/8/94	15:55	17.2	3.5				
19-s	7/9/94	17:11	14.9	3.8				
19-s	7/10/94	11:57	14.2	4.1				
19-s	7/12/94	10:00	11.3	5.2		3.0		

## In situ Respiration Data - FE Warren (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
19-m	7/7/94	16:30	18.0	1.8	130	11.0	17.9	
19-m	7/8/94	15:56	18.3	2.0				
19-m	7/9/94	17:10	15.3	2.9				
19-m	7/10/94	11:57	14.2	3.6				
19-m	7/12/94	10:01	11.0	4.8		6.0	18.5	
19-d	7/7/94	16:30	20.0	0.8	68	7.0		
19-d	7/8/94	15:56	19.3	0.9				
19-d	7/9/94	17:11	16.8	1.3				
19-d	7/10/94	11:58	15.8	1.9				
19-d	7/12/94	10:02	12.1	3.2		7.0		

20-s	7/7/94	14:55	20.0	1.3	140	8.0		
20-s	7/8/94	15:37	19.9	1.5				
20-s	7/9/94	17:19	19.8	0.9				
20-s	7/12/94	13:21	18.9	1.3		5.5		
20-m	7/7/94	14:55	18.5	2.5	170	10.0	14.6	
20-m	7/8/94	15:37	17.8	2.3				
20-m	7/9/94	17:19	18.0	2.8				
20-m	7/12/94	13:21	18.0	2.9		7.5	14.9	
20-d	7/7/94	14:55	18.5	2.3	170	7.0		
20-d	7/8/94	15:37	18.0	2.9				
20-d	7/9/94	17:19	17.8	2.8				
20-d	7/12/94	13:21	17.8	3.0		6.0		

21-s	7/7/94	14:48	19.5	1.3	150	10.0		Water in top of well
21-s	7/8/94	15:40	19.2	1.8				
21-s	7/9/94	8:50	19.8	1.8				
21-s	7/12/94	13:24	18.8	1.8		3.0		
21-s	7/13/94	7:41	18.9	2.0		6.0		
21-m	7/7/94	14:48	20.0	1.0	110	13.0	17.0	
21-m	7/8/94	15:40	19.2	1.8				
21-m	7/9/94	8:50	19.2	1.5				
21-m	7/12/94	13:24	16.8	1.9		6.0	16.8	
21-m	7/13/94	7:41	17.1	2.5		8.0	17.4	
21-d	7/7/94	14:48	21.0	0.1	53	10.0		
21-d	7/8/94	15:40	20.1	0.0				
21-d	7/9/94	8:50	20.2	0.2				
21-d	7/12/94	13:24	14.5	1.9		3.0		
21-d	7/13/94	7:41	15.5	2.4		5.0		

22-s	7/7/94	14:40	19.0	4.8	170	5.0		
22-s	7/8/94	15:44	19.5	4.5				
22-s	7/10/94	11:45	17.3	4.8				
22-s	7/12/94	9:22	16.0	5.8		2.0		
22-s	7/13/94	7:34	20.3	2.5		5.0		
22-m	7/7/94	14:40	20.0	0.8	100	10.0		
22-m	7/8/94	15:44	19.5	0.8				
22-m	7/10/94	11:45	19.5	1.1				
22-m	7/12/94	9:22	13.0	1.8		2.0		
22-m	7/13/94	7:34	13.5	2.0		4.0		

## In situ Respiration Data - FE Warren (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
22-d	7/7/94	14:40	21.0	0.0	54	11.0		
22-d	7/8/94	15:44	20.1	0.2				
22-d	7/10/94	11:45	20.2	0.2				
22-d	7/12/94	9:22	12.0	0.8		3.0		
22-d	7/13/94	7:34	12.5	1.0		3.0		

23-s	7/7/94	14:30						No flow
23-s	7/8/94	15:47	19.5	1.5				
23-s	7/10/94	11:49	17.8	2.6				
23-s	7/12/94	9:30	18.5	1.7		6.0		
23-s	7/13/94	7:26	18.9	1.8		2.0		
23-m	7/7/94	14:30	20.5	0.8	110	15.0	19.2	
23-m	7/8/94	15:47	20.0	0.9				
23-m	7/10/94	11:49	17.9	0.9				
23-m	7/12/94	9:30	12.0	1.5		10.0	18.6	
23-m	7/13/94	7:26	12.9	1.8		5.0	19.5	
23-d	7/7/94	14:30	21.0	0.1	54	11.0		
23-d	7/8/94	15:47	20.1	0.1				
23-d	7/10/94	11:49	18.2	0.2				
23-d	7/12/94	9:30	11.0	1.1		7.0		
23-d	7/13/94	7:26	11.5	2.8		3.0		

24-s	7/7/94	16:45	16.0	4.8	180	10.0		
24-s	7/8/94	15:52	16.5	4.5				
24-s	7/10/94	11:52	14.1	4.8				
24-s	7/11/94	10:12	12.0	5.8				
24-s	7/12/94	9:53	11.9	5.8		6.0		
24-m	7/7/94	16:45	18.5	2.8	140	9.0	17.7	
24-m	7/8/94	15:52	18.3	2.5				
24-m	7/10/94	11:52	13.9	3.8				
24-m	7/11/94	10:12	10.9	4.8				
24-m	7/12/94	9:53	11.5	4.8		6.5	18.6	
24-d	7/7/94	16:45	20.0	0.8	67	7.0		
24-d	7/8/94	15:52	19.5	0.9				
24-d	7/10/94	11:52	14.9	2.5				
24-d	7/11/94	10:12	11.5	3.8				
24-d	7/12/94	9:53	10.9	3.8		3.0		

25-s	7/6/94	15:35	18.0	2.2	295	8.0		Water in top of well
25-s	7/8/94	14:57	18.9	2.5				
25-s	7/9/94	17:23	19.8	1.5				
25-s	7/12/94	13:35	18.9	2.5		3.0		
25-m	7/6/94	15:35	17.8	1.4	270	18.0	12.9	
25-m	7/8/94	14:57	19.0	1.8				
25-m	7/9/94	17:23	19.8	1.8				
25-m	7/12/94	13:35	19.0	1.8		16.0	12.4	
25-d	7/6/94	15:35	18.5	1.2	240	10.0		
25-d	7/8/94	14:57	19.3	1.2				
25-d	7/9/94	17:23	19.0	1.0				
25-d	7/12/94	13:35	19.1	1.5		7.0		

## In situ Respiration Data - FE Warren A (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
26-s	7/6/94	15:25	19.0	1.4	220	7.0		
26-s	7/8/94	12:33	20.0	0.9				
26-s	7/8/94	15:00	19.8	1.8				
26-s	7/9/94	8:38	19.8	1.8				Used for N2 injection study
26-m	7/6/94	15:25	20.0	0.1	97	20.0	13.6	
26-m	7/8/94	12:33	20.2	0.1				
26-m	7/8/94	15:00	20.2	0.6				
26-m	7/9/94	8:38	20.0	0.8				
26-d	7/6/94	15:25	19.5	0.2	120	10.0		
26-d	7/8/94	12:33	20.9	0.0				
26-d	7/8/94	15:00	20.6	0.5				
26-d	7/9/94	8:38	20.4	0.2				
27-s	7/7/94	13:58	10.0	9.5	160	10.0		
27-s	7/8/94	11:40	10.0	9.3				
27-s	7/8/94	12:29	10.0	9.0				
27-s	7/8/94	15:09	10.2	8.9				
27-s	7/9/94	8:34	13.8	8.1				
27-s	7/9/94	20:20	11.0	8.8				
27-s	7/10/94	11:35	13.2	8.0				
27-s	7/12/94	13:30	15.3	6.2		3.0		
27-m	7/7/94	13:58	9.0	8.5	140	7.0	18.5	
27-m	7/8/94	11:40	8.5	9.8				
27-m	7/8/94	12:29	8.9	9.3				
27-m	7/8/94	15:09	9.0	9.9				
27-m	7/9/94	8:34	9.5	10.1				
27-m	7/9/94	20:20	8.0	10.8				
27-m	7/10/94	11:35	14.2	7.9				
27-m	7/12/94	13:30	14.0	6.5		6.0	17.5	
27-d	7/7/94	13:58	16.5	3.2	110	7.0		
27-d	7/8/94	11:40	12.8	6.0				
27-d	7/8/94	12:29	12.8	5.8				
27-d	7/8/94	15:09	12.5	6.2				
27-d	7/9/94	8:34	11.8	7.5				
27-d	7/9/94	20:20	9.0	9.0				
27-d	7/10/94	11:35	14.8	7.8				
27-d	7/12/94	13:30	16.2	4.5		2.0		
28-s	7/7/94	14:10	9.5	9.5	210	12.0		
28-s	7/8/94	11:37	4.8	12.0				
28-s	7/8/94	11:55	5	12.2				
28-s	7/8/94	12:20	4.8	11.9				
28-s	7/8/94	15:12	5.3	12.5				
28-s	7/8/94	17:33	8.0	12.3				
28-s	7/8/94	21:02	10.1	12.0				
28-s	7/9/94	8:26	10.5	10.9				
28-s	7/9/94	15:03	10.3	10.0				
28-s	7/9/94	20:25	9.9	12.0				Injection well on at 15:10
28-s	7/10/94	11:38	16.8	6.8				@ 32 ACFM
28-s	7/11/94	9:54	19.0	3.6				@ 50 ACFM

## In situ Respiration Data - FE Warren (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
28-s	7/12/94	8:03	15.1	5.8		2.0		Zero flow at 11:08
28-s	7/12/94	14:07	16.0	5		3.0		
28-s	7/13/94	8:50	12.1	7.0		2.0		
28-m	7/7/94	14:10	9.0	9.5	210	11.0	16.4	
28-m	7/8/94	11:37	7.0	11.2				
28-m	7/8/94	11:55	7.0	11.1				
28-m	7/8/94	12:20	7.1	10.5				
28-m	7/8/94	15:12	7.0	11.5				
28-m	7/8/94	17:33	6.9	11.9				
28-m	7/8/94	21:02	7.0	13.0				
28-m	7/9/94	8:26	6.8	12.9				
28-m	7/9/94	15:03	6.2	12.5				
28-m	7/9/94	20:25	12.8	10.9				
28-m	7/10/94	11:38	18.2	5.1				
28-m	7/11/94	9:54	19.8	2.7				
28-m	7/12/94	8:03	17.2	3.8		2.0	20.0	
28-m	7/12/94	14:07	16.5	3.8		3.0	19.9	
28-m	7/13/94	8:50	12.5	5.0		2.0	19.3	
28-d	7/7/94	14:10	15.0	5.0	230	10.0		
28-d	7/8/94	11:37	13.0	5.9	200	11.0		
28-d	7/8/94	11:55	14.2	5.0				
28-d	7/8/94	12:20	14.5	4.5				
28-d	7/8/94	15:12	14.3	5.0				
28-d	7/8/94	17:33	13.8	5.8				
28-d	7/8/94	21:02	13.1	6.8				
28-d	7/9/94	8:26	11.0	7.1				
28-d	7/9/94	15:03	9.5	7.5				
28-d	7/9/94	20:25	18.9	2.8				
28-d	7/10/94	11:38	19.9	1.4				
28-d	7/11/94	9:54	20.8	0.5				
28-d	7/12/94	8:03	20.1	0.8		2.5		
28-d	7/12/94	14:07	19.3	1.8		2.0		
28-d	7/13/94	8:50	17.2	2.4		3.0		
29-s	7/6/94	12:28	18.0	4.2	130	10.0		Injection well on at 15:10  @ 32 ACFM @ 50 ACFM  Zero flow at 11:08
29-s	7/6/94	14:37	15.0	5.0	240			
29-s	7/8/94	11:34	14.1	5.7				
29-s	7/8/94	12:25	14.0	5.8				
29-s	7/8/94	15:15	14.0	6.1				
29-s	7/8/94	17:28	13.8	6.3				
29-s	7/8/94	21:04	13.3	7.1				
29-s	7/9/94	8:22	13.6	6.5				
29-s	7/9/94	14:57	12.5	6.5				
29-s	7/9/94	20:29	9.5	7.8				
29-s	7/10/94	11:40	9.2	8.5				
29-s	7/11/94	10:00	11.7	9.5				
29-s	7/12/94	8:10	12	8.8		6.0		
29-s	7/12/94	14:10	13.9	7.1		2.0		
29-s	7/13/94	8:55	12.0	7.9		2.0		

In situ Respiration Data - FE Warren A (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
29-m	7/6/94	12:28	18.5	3.8	130	11.0	19.3	
29-m	7/6/94	14:37	15.0	5.0	240	9.0		
29-m	7/8/94	11:34	14.5	5.0				
29-m	7/8/94	12:25	14.2	4.8				
29-m	7/8/94	15:15	13.8	5.2				
29-m	7/8/94	17:28	13.2	5.5				
29-m	7/8/94	21:04	12.6	6.3				
29-m	7/9/94	8:22	10.9	6.3				
29-m	7/9/94	14:57	9.2	6.8				
29-m	7/9/94	20:29	8.1	7.8				
29-m	7/10/94	11:40	14.0	6.5				
29-m	7/11/94	10:00	17.2	4.5				
29-m	7/12/94	8:10	13.5	5.2		2.0	20.3	
29-m	7/12/94	14:10	12.8	5		2.0	20.3	
29-m	7/13/94	8:55	9.5	7.0		2.0	20.5	
29-d	7/6/94	12:28	21.0	0.8	65	11.0		
29-d	7/6/94	14:37	18.0	1.2	120			
29-d	7/8/94	11:34	19.0	1.2				
29-d	7/8/94	12:25	18.5	1.2				
29-d	7/8/94	15:15	17.2	2.0				
29-d	7/8/94	17:28	16.2	2.8				
29-d	7/8/94	21:04	15.0	3.8				
29-d	7/9/94	8:22	12.0	4.8				
29-d	7/9/94	14:57	10.0	4.9				
29-d	7/9/94	20:29	10.1	6.9				
29-d	7/10/94	11:40	18.1	2.8				
29-d	7/11/94	10:00	19.9	1.1				
29-d	7/12/94	8:10	15.9	3.5		2.0		
29-d	7/12/94	14:10	14.1	3.8		6.0		
29-d	7/13/94	8:55	10.1	5.9		2.0		
30-s	7/6/94	15:45	19.0	0.4	190	8.0		
30-s	7/8/94	14:53	20.9	0.2				
30-s	7/10/94	11:31	20.7	0.1				
30-s	7/12/94	13:41	20.8	0.2		3.0		
30-m	7/6/94	15:45	19.0	0.9	220	16.0	14.3	
30-m	7/8/94	14:53	20.0	0.9				
30-m	7/10/94	11:31	20.3	0.7				
30-m	7/12/94	13:41	20.2	0.8		5.0	13.7	
30-d	7/6/94	15:45	19.0	1.4	260	12.0		
30-d	7/8/94	14:53	20.2	1.2				
30-d	7/10/94	11:31	20.2	0.9				
30-d	7/12/94	13:41	20.2	1.1		3.0		
31-s	7/7/94	15:50	19.3	0.7	30			
31-s	7/8/94	11:29	20.5	0.1	88	11.0		
31-s	7/8/94	12:01	20.5	0.1				
31-s	7/8/94	14:48	20.5	0.1				
31-s	7/8/94	20:42	20.5	0.2				
31-s	7/10/94	11:26	20.8	0.1				
31-s	7/12/94	13:45	20.8	0.15		4.0		

## In situ Respiration Data - FE Warren (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
31-m	7/7/94	15:50	19.5	0.5	96	17.0	14.0	
31-m	7/8/94	11:29	20.5	0.1				
31-m	7/8/94	12:01	20.5	0.0				
31-m	7/8/94	14:48	19.5	0.2				
31-m	7/8/94	20:42	20.8	0.2				
31-m	7/10/94	11:26	20.1	0.6				
31-m	7/12/94	13:45	20.5	0.2		7.0	13.4	
31-d	7/7/94	15:50	19.1	0.8	110	10.0		
31-d	7/8/94	11:29	20.0	0.2				
31-d	7/8/94	12:01	20.3	0.2				
31-d	7/8/94	14:48	20.5	0.2				
31-d	7/8/94	20:42	20.3	0.9				
31-d	7/10/94	11:26	20.3	0.6				
31-d	7/12/94	13:45	20.3	0.8		3.5		
32-m	7/8/94	9:01	3.8	16.5	92	15.0	16.6	
32-m	7/8/94	11:15	4.5	14.5				
32-m	7/8/94	11:27	4.2	14.0				
32-m	7/8/94	11:44	3.9	14.3				
32-m	7/8/94	11:58	3.8	14.1				
32-m	7/8/94	12:17	3.9	13.8				
32-m	7/8/94	13:31	3.9	15.0				
32-m	7/8/94	14:44	4.2	14.2				
32-m	7/8/94	15:28	4.2	14.9				
32-m	7/9/94	8:41	5.8	14.2				
32-m	7/9/94	20:48	5.2	15.1				
32-m	7/10/94	11:23	5.8	13				
32-m	7/12/94	7:58	7	13.1		10.0	17.4	
32-d	7/8/94	9:01	0.0	21.0	2900	6.0		
32-d	7/8/94	11:16	0.0	19.0				
32-d	7/9/94	20:49	0.0	19.0				
32-d	7/10/94	11:23	0.0	16.9				
33-s	7/8/94	8:50	18.0	4.2	90	4.0		
33-s	7/8/94	11:18	17.5	4.0				
33-s	7/8/94	11:46	18.1	2.3				
33-s	7/8/94	12:12	18.2	2.0				
33-s	7/8/94	15:25	16.5	4.8				
33-s	7/8/94	17:36	16.0	5.8				
33-s	7/8/94	21:00	16.1	6.0				
33-s	7/9/94	8:43	17.1	4.8				
33-s	7/9/94	20:33	16.8	4.8				Injection well on at 15:10
33-s	7/10/94	11:14	16.9	4.9				@ 32 ACFM
33-s	7/11/94	9:48	16.0	5.0				@ 50 ACFM
33-s	7/12/94	7:54	16.0	4.8		2.0		
33-s	7/12/94	14:00	15.8	4.8		6.0		Zero flow at 11:08
33-s	7/13/94	9:13	18.0	3.8		22.0		



## In situ Respiration Data - FE Warren A (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
33-m	7/8/94	8:50	10.0	10.5	110	8.0	15.4	
33-m	7/8/94	11:18	6.8	12.5				
33-m	7/8/94	11:46	6.8	12.2				
33-m	7/8/94	12:12	6.8	12.0				
33-m	7/8/94	15:25	7.1	12.9				
33-m	7/8/94	17:36	7.2	13.1				
33-m	7/8/94	21:00	7.5	14.0				
33-m	7/9/94	8:43	8.8	12.9				
33-m	7/9/94	20:33	8.3	12				
33-m	7/10/94	11:14	11	9.3				
33-m	7/11/94	9:48	10.7	8.5				
33-m	7/12/94	7:54	9.3	8.9		3.5	16.2	
33-m	7/12/94	14:00	9	8.5		4.0	15.6	
33-m	7/13/94	9:13	9.0	10.5		3.0	15.5	
33-d	7/8/94	8:50	5.0	15.0	840	10.0		Strong HC smell
33-d	7/8/94	11:20	0.0	16.0				
33-d	7/8/94	11:48	0.0	16.0				
33-d	7/9/94	20:35	0.0	17.5				
33-d	7/10/94	11:17	0.0	15.8				
33-d	7/11/94	9:51	0.0	15.5				
33-d	7/12/94	7:55	0.0	15.8		4.0		
33-d	7/12/94	7:55	0.0	15.8				
34-s	7/6/94	10:50	17.0	3.1	190	10.0		Injection well on at 15:10  @ 32 ACFM @ 50 ACFM  Zero flow at 11:08
34-s	7/6/94	16:08	16.5	4.0				
34-s	7/8/94	11:23	17.5	3.8				
34-s	7/8/94	11:50	17.0	3.8				
34-s	7/8/94	12:05	17.0	3.5				
34-s	7/8/94	15:22	16.8	4.0				
34-s	7/8/94	17:38	16.5	4.3				
34-s	7/8/94	20:59	16.5	4.5				
34-s	7/9/94	8:46	15.5	4.8				
34-s	7/9/94	15:06	14.9	4.8				
34-s	7/9/94	20:38	17.9	4.3				
34-s	7/10/94	11:18	19.3	1.9				
34-s	7/11/94	9:40	20	1.5				
34-s	7/12/94	7:45	18.2	2.8		1.0		
34-s	7/12/94	14:04	17.1	3		3.0		
34-s	7/13/94	9:20	16.0	4.0		5.0		
34-m	7/6/94	16:08	17.0	2.9	180	11.0	18.0	
34-m	7/8/94	11:23	18.0	2.2				
34-m	7/8/94	11:50	17.5	3.1				
34-m	7/8/94	12:05	17.8	3.0				
34-m	7/8/94	15:22	17.0	3.8				
34-m	7/8/94	17:38	16.5	3.9				
34-m	7/8/94	20:59	16.3	4				
34-m	7/9/94	8:46	14.7	4.5				
34-m	7/9/94	15:06	13.8	4.5				
34-m	7/9/94	20:38	18.2	3.8				
34-m	7/10/94	11:18	19.6	1.8				
34-m	7/11/94	9:40	20	1.2				
34-m	7/12/94	7:45	18.5	2.4		3.0	20.3	
34-m	7/12/94	14:04	17.6	2.5		3.0	19.3	
34-m	7/13/94	9:20	15.5	3.9		2.0	20.0	

## In situ Respiration Data - FE Warren A (7-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
34-d	7/6/94	16:08	18.0	1.8	180	10.0		
34-d	7/8/94	11:23	19.2	1.3				
34-d	7/8/94	11:50	18.9	1.5				
34-d	7/8/94	12:05	18.5	1.5				
34-d	7/8/94	15:22	18.0	2.0				
34-d	7/8/94	17:38	17.5	2.3				
34-d	7/8/94	20:59	17.1	2.5				
34-d	7/9/94	8:46	15	2				
34-d	7/9/94	15:06	14.1	3.1				
34-d	7/9/94	20:38	19.7	1.8				
34-d	7/10/94	11:18	20.5	0.1				
34-d	7/11/94	9:40	20.9	0.1				
34-d	7/12/94	7:45	20	0.8		2.0		
34-d	7/12/94	14:04	18.6	0.9		3.0		
34-d	7/13/94	9:20	15.8	1.1		2.0		

## In situ Respiration Test Data - FE Warren (10-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
1-s	10/13/94	10:00	17.5	3.8	180	5.0	15.2	Ambient Temp 8.3 C
1-s	10/13/94		18.8	2.8				
1-s	10/14/94	10:20	18.5	3.0	220	5.0	14.4	
1-s	10/15/94	11:57	17.9	3.3	170	1.0	14.7	
1-s	10/16/94	12:45	17	3.0	130	1.5	13.9	
1-s	10/17/94	10:27	15	3.3	140	6.0	12.8	
1-m	10/13/94	10:00	17.0	4.2	180	2.0	17.4	
1-m	10/13/94		17.5	2.5				
1-m	10/14/94	10:20	17.2	3.5	220			
1-m	10/15/94	11:57	16.5	3.8	180	1.0	16.2	
1-m	10/16/94	12:45	14.8	4.3	150	1.0	15.9	
1-m	10/17/94	10:27	14.0	4.5	140	2.5	16.0	
1-d	10/13/94	10:00	17.0	4.2	180	5.0	11.1	
1-d	10/13/94		18.5	3.0				
1-d	10/14/94	10:20	16.5	3.7	230	5.0	15.7	
1-d	10/15/94	11:57	15.3	4.3	180	1.5	15.8	
1-d	10/16/94	12:45	13.5	4.8	150	1.0	16.0	
1-d	10/17/94	10:27	12.2	5.3	130	1.0	15.5	Cal Check

2-s	10/13/94		19.5	2.0	120	1.0	8.5	
2-s	10/13/94		20.0	1.5				
2-s	10/14/94	10:21	20.0	1.2	140	5.0	19.5	
2-s	10/15/94	12:30	18.8	1.4	100	6.0	14.1	
2-s	10/16/94	12:36	18.5	1.3	100	5.0	14.2	
2-s	10/17/94	10:36	17.6	1.3	70		13.8	
2-m	10/13/94		19.5	2.0	120	2.0		
2-m	10/13/94		20.0	1.5				
2-m	10/14/94	10:21	19.5	1.5	140	5.0		
2-m	10/15/94	12:30	17.8	2.0	120	6.0		
2-m	10/16/94	12:36	17.2	2.2	110	5.0		
2-m	10/17/94	10:36	16.2	2.5	100	1.0		
2-d	10/13/94		19.0	2.5	140	5.0	16.0	
2-d	10/13/94		19.5	1.5				
2-d	10/14/94	10:21	19.0	1.9	180	5.0	15.6	
2-d	10/15/94	12:30	17.5	2.3	120	1.0	1.5	
2-d	10/16/94	12:36	16.1	2.6	120	2.0	15.9	
2-d	10/17/94	10:36	15.3	2.5	100	3.0	15.9	

3-s	10/13/94		18.4	3.2	150	4.0	15.8	
3-s	10/13/94		19.5	2.5				
3-s	10/14/94	10:30	18.5	2.7	190	4.0	15.2	
3-s	10/15/94	12:38	17.0	3.1	130	5.0	15.1	
3-s	10/16/94	12:30	15.5	3.3	130	5.0	14.7	
3-s	10/17/94	10:45	14.2	3.3	140	2.0	14.2	
3-m	10/13/94		17.8	3.7	180	3.0	17.8	
3-m	10/13/94		19.0	3.0				
3-m	10/14/94	10:30	17.7	3.2	190	2.0	17.2	
3-m	10/15/94	12:38	16.0	3.7	150	1.0	17.4	
3-m	10/16/94	12:30	14.6	4.7	140	6.0	17.2	
3-m	10/17/94	10:45	13.0	3.8	140	4.0	17.1	

## In situ Respiration Test Data - FE Warren (10-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
3-d	10/13/94		17.1	4.3	200	5.0		
3-d	10/13/94		18.5	3.5				
3-d	10/14/94	10:30	17.6	3.5	200	2.0		
3-d	10/15/94	12:38	16.3	3.7	150	5.0		
3-d	10/16/94	12:30	15.2	4.0	140	5.0		
3-d	10/17/94	10:45	13.7	4.0	130	5.0		

4-s	10/13/94		10.5	9.8	230	5.0	15.9	1/2" Water in Vault no air injection before shutdown
4-s	10/13/94		12.0	7.5				
4-s	10/14/94	10:35	12.2	8.0	220	2.0	23.0	
4-s	10/15/94	12:48	11.0	8.3	170	5.0	1.2	
4-s	10/16/94	12:25	10.0	8.6	160	3.0	14.7	
4-s	10/17/94	10:53	9.5	8.5	160	3.0	14.5	
4-m	10/13/94		8.0	12.0	240	6.0	17.2	no air injection before shutdown
4-m	10/13/94		11.0	9.0				
4-m	10/14/94	10:35	9.0	10.2	230	2.0	16.5	
4-m	10/15/94	12:48	9.6	9.2	170	1.0	-0.5	
4-m	10/16/94	12:25	6.8	11.8	160	6.0	16.4	
4-m	10/17/94	10:53	6.0	12.0	170	6.0	16.6	
4-d	10/13/94		6.0	13.5	240	6.0	2.1	no air injection before shutdown
4-d	10/13/94		9.5	10.0				
4-d	10/14/94	10:35	7.0	11.5	220	2.0	16.4	
4-d	10/15/94	12:48	8.3	10.0	170	1.0	-0.4	
4-d	10/16/94	12:25	4.6	13.2	160	4.0	16.9	
4-d	10/17/94	10:53	6.5	10.5	180	6.0	17.0	

5-s	10/13/94		14.3	6.1	210	6	3.7	1/2" Water in Vault pulsing test well
5-s	10/13/94		19.4	2.0				
5-s	10/14/94	10:40	18.5	4.5	180	2.0	14.7	
5-s	10/15/94	12:54	19.3	1.8	100	1.0	15.0	
5-s	10/16/94	12:11	17.8	3.0	130	6.0	14.4	
5-s	10/17/94	11:01	17.0	3.5	160	1.5	12.9	
5-m	10/13/94		6.3	12.3	220	6	2.7	pulsing test well
5-m	10/13/94		9.0	9.5				
5-m	10/14/94	10:40	17.2	4.8	220	2.0	23.0	
5-m	10/15/94	12:54	10.5	10.0	170	2.0	-1.0	
5-m	10/16/94	12:11	8.0	12.0	160	6.0	16.8	
5-m	10/17/94	11:01	8.7	10.8	190	1.5	3.4	
5-d	10/13/94		1.3	17.2	220	6	18.1	pulsing test well
5-d	10/13/94		6.0	12.0				
5-d	10/14/94	10:40	16.5	5.5	180	5.0	22.5	
5-d	10/15/94	12:54	6.3	13.2	170	1.0	7.9	
5-d	10/16/94	12:11	3.0	16.5	160	6.0	17.6	
5-d	10/17/94	11:01	6.5	10.5	200	2.5	17.4	

6-s	10/13/94		17.5	5.6	200	5	15.5	pulsing test well
6-s	10/13/94		20.5	5.0				
6-s	10/14/94	10:45	18.0	4.5	200	2.0	14.6	
6-s	10/16/94	12:52	15.5	4.8	150	5.0	13.6	
6-s	10/17/94	11:11	14.7	5.2	170	2.5	13.7	

## In situ Respiration Test Data - FE Warren B (10-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
6-m	10/13/94		18.2	5	210	6	16.7	pulsing test well
6-m	10/13/94		20.0	0.5				
6-m	10/14/94	10:45	17.2	4.8	200	2.0	15.7	
6-m	10/16/94	12:52	14.0	6.0	150	6.0	16.0	
6-m	10/17/94	11:11	13.5	6.4	180	2.5	16.2	
6-d	10/13/94		17.8	5.7	210	6	2.5	pulsing test well
6-d	10/13/94		18.0	0.5				
6-d	10/14/94	10:45	16.5	5.5	200	2.0	17.3	
6-d	10/16/94	12:52	13.2	6.8	150	5.0	16.6	
6-d	10/17/94	11:11	12.7	7.1	170	2.5	16.1	

7-s	10/13/94		15.0	7.4	230	4.0		no air injection before shutdown
7-s	10/14/94	10:50	16.5	5.8	200	2.0		
7-s	10/17/94	11:19	15.6	6.0	160	3.0		
7-m	10/13/94		13.6	8.5	230	5.0	16.8	no air injection before shutdown
7-m	10/14/94	10:50	14.2	7.8	220	2.0	16.4	
7-m	10/17/94	11:19	15.0	7.0	160	1.0	16.6	
7-d	10/13/94		12.5	10.0	210	1.0		no air injection before shutdown
7-d	10/14/94	10:50	13.2	8.9	210	2.0		
7-d	10/17/94	11:19	14.5	7.7	170	1.0		

8-s	10/13/94		14.0	8.0	220	2.0		no air injection before shutdown
8-s	10/14/94	10:55	14.2	7.3	210	1.0		
8-s	10/16/94	1:10	14	7.2	160	6.0		
8-m	10/13/94		12.0	10.0	220	3.0	18.7	no air injection before shutdown
8-m	10/14/94	10:55	12.2	9.4	220	2.0	18.3	
8-m	10/16/94	1:10	12.3	8.9	160	6.0	18.4	
8-d	10/13/94		10.6	11.0	220	2.0		no air injection before shutdown
8-d	10/14/94	10:55	10.5	11.4	220	2.0		
8-d	10/16/94	1:10	10.2	11.2	150	1.5		

9-s	10/13/94		15.0	6.0	190	1.0		no air injection before shutdown
9-s	10/14/94	11:03	15.2	6.3	220	2.0		
9-s	10/15/94	2:15	17	4.6	170	1.0		
9-s	10/16/94	1:17	15.2	5.7	150	1.0		
9-m	10/13/94		13.0	8.3	200	2.0	19.2	no air injection before shutdown
9-m	10/14/94	11:03	13.5	8.0	230	2.0	19.0	
9-m	10/15/94	2:15	14.5	6.8	180	1.0	19.3	
9-m	10/16/94	1:17	13.2	7.7	150	1.0	20.7	
9-d	10/13/94		12.0	9.5	200	1.0		no air injection before shutdown
9-d	10/14/94	11:03	11.5	9.7	220	1.0		
9-d	10/15/94	2:15	13.5	7.6	200	0.5		
9-d	10/16/94	1:17	11.7	9.2	160	1.0		

10-s	10/13/94		14.5	7.5	200	2.0		pulsing test well
10-s	10/14/94	2:28	15.2	6.5	260	1.5		
10-s	10/15/94	11:14	16.5	6.5	200	3.0		
10-s	10/16/94	12:05	15.5	6.0	180	6.0		
10-s	10/17/94	9:56	14.3	6.9	190	1.0		

## In situ Respiration Test Data - FE Warren AEB (10-94)

Sampling Point	Date	Time	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH (ppm)	Pump F. (in Hg)	Temp (C)	Comments
10-m	10/13/94		14.5	7.5	200	5.0	19.8	pulsing test well
10-m	10/14/94	2:28	14.0	7.2	260	1.0	19.4	
10-m	10/15/94	11:14	15.4	7.5	200	6.0	19.8	
10-m	10/16/94	12:05	13.5	8.0	160	6.0	19.6	
10-m	10/17/94	9:56	12.7	8.2	190	1.0	19.5	
10-d	10/13/94		16.0	5.3	190	5.0		pulsing test well
10-d	10/14/94	2:28	14.2	6.5	240	1.0		
10-d	10/15/94	11:14	15.0	7.2	220	6.0		
10-d	10/16/94	12:05	12.8	8.4	160	6.0		
10-d	10/17/94	9:56	12.4	9.0	200	1.0		

11-s	10/13/94		13.0	10.5	210	1.0	-	pulsing test well
11-s	10/14/94	10:00	15.8	7.5	240			
11-s	10/15/94	11:04	16.0	7.0	190	1.5		
11-s	10/16/94	11:15	14	7.2	200	5.0		
11-s	10/17/94	9:49	14.0	6.7	200	2.5		
11-m	10/13/94		11.4	11.5	200	2.0	16.9	pulsing test well
11-m	10/14/94	10:00	12.2	11.0	260	5.0	16.1	
11-m	10/15/94	11:04	11.0	11.5	190	6.0	17.2	
11-m	10/16/94	11:15	8.5	12.7	210	5.0	16.8	
11-m	10/17/94	9:49	7.5	12.3	200	6.0	16.7	
11-d	10/13/94		5.2	16.8	20	5.0		pulsing test well
11-d	10/14/94	10:00	4.2	17.2	250	6.0		
11-d	10/14/94	2:30	1.8	20.0	260	4.0		
11-d	10/15/94	11:04	2.3	19.5	210	1.0		
11-d	10/16/94	11:15	0.2	22.0	220	5.0		
11-d	10/17/94	9:49	0.2	22.0	190	6.0		

12-s	10/13/94		8.5	13.5	190	2.0		no air injection before shutdown
12-s	10/14/94	2:20	9.5	12.8	260	5.0		
12-s	10/15/94	11:20	12.0	10.8	200	1.0		
12-s	10/16/94	11:10	10.7	12.0	200	1.0		
12-s	10/17/94	9:44	10.5	12.5	200	2.5		
12-m	10/13/94		7.0	15.0	180		16.6	no air injection before shutdown
12-m	10/14/94	2:20	8.0	15.0	260	1.0	16.3	
12-m	10/15/94	11:20	9.4	14.5	190	1.0	16.4	
12-m	10/16/94	11:10	8.6	14.6	210	2.0	16.9	
12-m	10/17/94	9:44	9.3	14.2	200	3.0	16.2	
12-d	10/13/94		6.0	16.0	180	2.0		no air injection before shutdown
12-d	10/14/94	2:20	6.0	16.5	260	1.0		
12-d	10/15/94	11:20	8.1	15.5	190	1.0		
12-d	10/16/94	11:10	7.0	17.0	220	2.5		
12-d	10/17/94	9:44	8.0	14.8	190	7.0		

13-s	10/13/94		6.2	19.0	190	2.0		pure O <sub>2</sub> test well
13-s	10/14/94	11:17	6.5	19.0	200	2.0		
13-s	10/15/94	11:36	9	16.0	190	6.0		
13-s	10/16/94	11:03	5.5	19.2	190	1.5		
13-s	10/17/94	9:36	4.8	19.5	200	5.0		

## In situ Respiration Test Data - FE Warren 3 (10-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
13-m	10/13/94		4.0	23.0	200	1.0	21.3	pure O2 test well
13-m	10/14/94	11:17	3.5	24.0	190	1.5	15.1	
13-m	10/15/94	11:36	5.0	22.5	210	1.5	21.2	
13-m	10/16/94	11:03	3.1	24.0	180	3.0	21.2	
13-m	10/17/94	9:36	4.0	20.0	190	3.0	20.9	
13-d	10/13/94		2.5	>25	190	2.0		pure O2 test well
13-d	10/14/94	11:17	1.8	>25	180	1.5		
13-d	10/15/94	11:36	3.0	>25	200	1.5		
13-d	10/16/94	11:03	1.5	>25	180	4.0		
13-d	10/17/94	9:36	2.0	>25	180	6.0		
14-s	10/13/94		14.5	7.8	200	1.0		pure O2 test well
14-s	10/14/94	11:11	14.3	7.5	220	2.0		
14-s	10/15/94	11:33	14.4	7.8	205	6.0		
14-s	10/16/94	10:57	14.0	8.3	200	1.0		
14-s	10/17/94	9:20	14.0	8.2	200	6.0		
14-m	10/13/94		11.0	11.7	210	1.0	20.0	Snowing pure O2 test well
14-m	10/14/94	11:11	11.0	11.5	210	2.0	19.8	
14-m	10/15/94	11:33	11.5	11.5	210	1.0	19.7	
14-m	10/16/94	10:57	10.5	12.8	200	1.0	19.7	
14-m	10/17/94	9:20	10.6	12.5	21	6.0	20.8	
14-d	10/13/94		9.0	15.0	200	2.0		pure O2 test well
14-d	10/14/94	11:11	9.5	14.0	220	2.0		
14-d	10/15/94	11:33	10.5	13.0	210			
14-d	10/16/94	10:57	8.0	15.5	200	3.0		
14-d	10/17/94	9:20	8.5	15.2	200	7.0		
15-s	10/13/94		17.0	4.7	190	5.0		pulsing test well
15-s	10/14/94	2:36	17.7	4.0	240	1.0		
15-s	10/15/94	2:38	18.5	3.5	150	0.5		
15-s	10/16/94	12:00	18.0	3.4	140	6.0		
15-s	10/17/94	10:02	17.5	3.8	160	1.5		
15-m	10/13/94		16.5	4.7	190	6.0	15.0	pulsing test well
15-m	10/14/94	2:36	16.8	4.6	240	1.0	26.4	
15-m	10/15/94	2:38	17.6	4.3	180	0.5	15.1	
15-m	10/16/94	12:00	17.0	4.7	150	4.0	15.0	
15-m	10/17/94	10:02	17.5	4.3	160	1.0	15.1	
15-d	10/13/94		16.2	4.8	190	2.0		pulsing test well
15-d	10/14/94	2:36	16.5	4.6	240	3.0		
15-d	10/15/94	2:38	17.3	4.4	170	0.5		
15-d	10/16/94	12:00	17.0	4.9	160	6.0		
15-d	10/17/94	10:02	17.0	4.7	170	2.0		
16-s	10/13/94		18.0	3.7	160	2.0		pulsing test well
16-s	10/14/94	2:42	16.5	3.5	230	2.0		
16-s	10/15/94	2:31	18.3	3.4	150	1.0		
16-s	10/16/94	11:55	17.2	3.8	140	5.0		
16-s	10/17/94	10:07	17.5	3.7	150	1.5		

## In situ Respiration Test Data - FE Warren (10-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
16-m	10/13/94		17.6	4.0	160	2.0	16.2	pulsing test well
16-m	10/14/94	2:42	16.2	3.8	240	2.0	16.2	
16-m	10/15/94	2:31	17.6	3.7	150	1.5		
16-m	10/16/94	11:55	16.5	4.5	160	1.5		
16-m	10/17/94	10:07	17.1	4.1	160	1.0		
16-d	10/13/94		18.5	3.7	160	2.0		pulsing test well
16-d	10/14/94	2:42	16.2	3.8	210	4.0		
16-d	10/15/94	2:31	17.5	3.8	150	1.0		
16-d	10/16/94	11:55	16.5	4.4	150	6.0		
16-d	10/17/94	10:07	16.3	4.3	160	6.0		

17-s	10/13/94		14.0	6.8	190	2.0		no air injection before shutdown
17-s	10/14/94		14.4	6.3				
17-s	10/15/94	2:25	15.2	6.3	180	6.0		
17-s	10/16/94	11:48	13.0	7.5	150	1.0		
17-s	10/17/94	10:12	12.6	7.5	190	1.0		
17-m	10/13/94		14.0	7.0	190	3.0	17.8	no air injection before shutdown
17-m	10/14/94		14.3	6.5				
17-m	10/15/94	2:25	14.3	6.9	190	6.0	17.6	
17-m	10/16/94	11:48	12.0	8.5	150	5.0	17.8	
17-m	10/17/94	10:12	11.7	8.2	190	1.0	17.4	
17-d	10/13/94		14.5	6.1	180	3.0		no air injection before shutdown
17-d	10/14/94		14.8	5.8				
17-d	10/15/94	2:25	13.7	7.1	190	4.0		
17-d	10/16/94	11:48	11.5	9.3	150	3.0		
17-d	10/17/94	10:12	11.2	9.8	190	1.0		

18-s	10/13/94		8.3	15.0	200	3.0		pure O2 test well
18-s	10/14/94	11:22	7.6	16.2	200	2.0		
18-s	10/15/94	11:48	9.0	14.8	210	2.0		
18-s	10/16/94	10:43	5.8	16.5	200	5.0		
18-s	10/17/94	9:08	5.0	17.0	220	7.0		
18-m	10/13/94		7.6	15.4	200	3.0	21.8	pure O2 test well
18-m	10/14/94	11:22	6.2	17.5	200	5.0	21.5	
18-m	10/15/94	11:48	7.0	16.5	210	2.0	21.8	
18-m	10/16/94	10:43	4.0	20.0	200	6.0	21.8	
18-m	10/17/94	9:08	3.5	20.0	200	7.0	22.4	
18-d	10/13/94		8.0	15.5	200	2.0		pure O2 test well
18-d	10/14/94	11:22	4.5	19.0	200	1.5		
18-d	10/15/94	11:48	5.5	18.0	220	3.0		
18-d	10/16/94	10:43	3.0	22.0	200	6.0		
18-d	10/17/94	9:08	4.3	19.0	180	6.0		

19-s	10/13/94		9.5	14.3	200	2.0		pure O2 test well
19-s	10/14/94	11:27	7.2	17.0	210	2.0		
19-s	10/15/94	11:40	8.5	16.2	200	5.0		
19-s	10/16/94	10:51	7.0	17.5	200	5.0		
19-s	10/17/94	9:13	8.3	16.5	180	7.0		



## In situ Respiration Test Data - FE Warren 3 (10-94)

Sampling Point	Date	Time	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
19-m	10/13/94		7.2	16.2	205	2.0		pure O <sub>2</sub> test well
19-m	10/14/94	11:27	4.7	21.0	200	2.5		
19-m	10/15/94	11:40	6.8	18.0	200	1.5		
19-m	10/16/94	10:51	3.8	22.5	190	4.0		
19-m	10/17/94	9:13	4.8	22.0	200	7.0		
19-d	10/13/94		8.3	14.5	200	2.0		pure O <sub>2</sub> test well
19-d	10/14/94	11:27	4.0	22.0	200	0.2		
19-d	10/15/94	11:40	5.0	21.0	200	5.0		
19-d	10/16/94	10:51	2.8	24.0	180	4.0		
19-d	10/17/94	9:13	3.5	24.0	220	7.0		

24-s	10/13/94		18.0	3.0	160	2.0		
24-s	10/14/94	2:50	18.0	2.5	220	3.0		
24-s	10/15/94	2:40	17	3.5	160			
24-s	10/16/94	1:23	15.8	3.4	140	3.0		
24-s	10/17/94	11:25	14.0	3.5	120			
24-m	10/14/94	2:50	18.0	2.5	140	5.0	16.6	
24-m	10/15/94	2:40	16.5	3.1	190	3.0	16.0	
24-m	10/16/94	1:23	15.3	3.5	160		16.2	
24-m	10/17/94	11:25	13.5	3.5	130	6.0	17.2	
24-d	10/13/94		19.0	1.6	130		16.5	
24-d	10/14/94	2:50	19.0	2.2	100	3.0		
24-d	10/15/94	2:40	17.0	2.5	180	4.0		
24-d	10/16/94	1:23	15.6	2.8	150			
24-d	10/17/94	11:25	14.5	3.3	130	2.0		

27-s	10/13/94		14.5	4.5	170	2.0		
27-s	10/14/94	11:42	15.3	5.5	200	6.0		
27-s	10/15/94	10:00	14.0	4.5	210	4.0		
27-s	10/16/94	10:05	14.0	6.0	230	1.0		
27-s	10/17/94	8:28	13.5	5.8	200	1.5		
27-m	10/13/94		15.5	4.5	170	2.0	18.0	
27-m	10/14/94	11:42	12.8	6.2	210	6.0	16.8	
27-m	10/15/94	10:00	13.2	6.3	230	4.0	18.8	
27-m	10/16/94	10:05	11.0	7.5	230	3.0	18.8	
27-m	10/17/94	8:28	9.6	8.0	210	1.5	19.1	
27-d	10/13/94		18.5	2.2	120	2.0		
27-d	10/14/94	11:42	15.0	3.8	200	6.0		
27-d	10/15/94	10:00	16.3	4.8	220	5.0		
27-d	10/16/94	10:05	11.7	6.5	220	5.0		
27-d	10/17/94	8:28	10.5	7.0	200	2.5		

28-s	10/13/94		13.0	6.5	170	3.0		
28-s	10/14/94	11:38	11.7	8.0	220	1.5		
28-s	10/15/94	10:10	12.3	7.4	230	3.0		
28-s	10/16/94	10:12	8.8	8.8	230	5.0		
28-s	10/17/94	8:30	6.2	9.4	230	1.5		

## In situ Respiration Test Data - FE Warren FEB (10-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Rate (in Hg)	Temp (C)	Comments
28-m	10/13/94		11.8	8.0	180	5.0	20.9	
28-m	10/14/94	11:38	8.5	10.0	220	1.0	20.6	
28-m	10/15/94	10:10	9.5	9.0	230	4.0	21.5	
28-m	10/16/94	10:12	4.9	12.5	230	2.0	21.5	
28-m	10/17/94	8:30	3.5	12.7	230	1.0	21.0	
28-d	10/13/94		16.0	3.4	170	5.0		
28-d	10/14/94	11:38	12.5	5.8	220	6.0		
28-d	10/15/94	10:10	11.3	6.3	220	3.0		
28-d	10/16/94	10:12	5.8	9.3	220	2.0		
28-d	10/17/94	8:30	4.0	10.5	230	1.0		

29-s	10/13/94		14.5	4.5	20	3.0		
29-s	10/14/94	11:32	14.2	5.7	210	6.0		
29-s	10/15/94	10:20	13.5	5.5	210	5		
29-s	10/16/94	10:16	11.0	7.0	230	4.0		
29-s	10/17/94	8:36	6.8	10.5	200	1.0		
29-m	10/13/94		14.0	4.5	200	2.0	18.8	
29-m	10/14/94	11:32	11.8	6.2	200	5.0	17.8	
29-m	10/15/94	10:20	11.5	6.3	220	5.0	18.5	
29-m	10/16/94	10:16	7.5	8.5	220	2.0	19.4	
29-m	10/17/94	8:36	6.0	9.3	210	1.5	18.9	
29-d	10/13/94		17.8	2.0	140	2.0		
29-d	10/14/94	11:32	12.4	4.7	200	6.0		
29-d	10/15/94	10:20	11.2	6.2	22	2.0		
29-d	10/16/94	10:16	6.5	8.8	240	6.0		
29-d	10/17/94	8:36	4.5	9.8	210	2.0		

32-s	10/13/94		11.8	7.5	170	17.0		
32-s	10/14/94	12:00	11.0	8.3	260	4.0		
32-s	10/15/94	10:49	13	7.5	230	11.0		
32-s	10/16/94	10:33	13.0	8.0	300	10.0		
32-s	10/17/94	8:58	12.5	8.7	230	15.0		
32-m	10/13/94		9.5	10.5	200	5.0	16.7	
32-m	10/14/94	12:00	6.5	13.0	250	6.0	16.4	
32-m	10/15/94	10:49	8.3	12.3	230	11.0	17.1	
32-m	10/16/94	10:33	7.3	14.0	310	9.0	17.2	
32-m	10/17/94	8:58	8.1	13.0	240	7.0	16.7	Odor
32-d	10/13/94		3.8	15.4	1,000	5.0		
32-d	10/14/94	12:00	0.5	19.0	2,400	3.0		
32-d	10/15/94	10:49	2.8	17.5	3,400	5.0		
32-d	10/16/94	10:33	0	22	3,000	3		
32-d	10/17/94	8:58	0.0	22.0	3,000	1.5		

33-s	10/13/94		12.8	4.8	200	4.0		
33-s	10/14/94	11:53	14.0	6.2	220	6.0		
33-s	10/15/94	10:42	15.4	6.2	190	5.0		
33-s	10/16/94	10:28	14.4	7.3	230	1.5		
33-s	10/17/94	8:52	14.8	7.0	220	1.0		

## In situ Respiration Test Data - FE Warren 3 (10-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
33-m	10/13/94		13.0	7.8	240	3.0	17.3	
33-m	10/14/94	11:53	10.3	9.2	200	6.0	16.8	
33-m	10/15/94	10:42	11.2	9.0	210	6.0	17.7	
33-m	10/16/94	10:28	10.0	10.6	240	2.0	17.8	
33-m	10/17/94	8:52	10.6	10.3	220	4.0	17.9	
33-d	10/13/94		3.5	13.2	530	5.0		Odor
33-d	10/14/94	11:53	1.0	15.5	1,000	7.0		
33-d	10/15/94	10:42	3.5	14.5	1,100	7.0		
33-d	10/16/94	10:28	0.0	18.0	1,200	4.0		
33-d	10/17/94	8:52	0.8	17.5	1,000	5.0		

34-s	10/13/94		18.8	2.2	120	4.0		
34-s	10/14/94	11:49	16.3	3.3	190	6.0		
34-s	10/15/94	10:35	16.2	3.8	210	5.0		
34-s	10/16/94	10:23	13.8	4.8	200	2.5		
34-s	10/17/94	8:42	12.5	5.6	180	1.5		
34-m	10/13/94		18.8	2.4	130	2.0	21.2	
34-m	10/14/94	11:49	15.3	3.7	200	1.0	21.5	
34-m	10/15/94	10:35	14.2	4.4	210	5.0	21.5	
34-m	10/16/94	10:23	11.7	6.2	220	2.5	21.9	
34-m	10/17/94	8:42	10.0	7.0	190	7.0	21.6	
34-d	10/13/94		19.5	1.7	90			
34-d	10/14/94	11:49	16.0	2.5	180	1.0		
34-d	10/15/94	10:35	14.0	4.0	200	3.0		
34-d	10/16/94	10:23	10.5	6.0	220	1.5		
34-d	10/17/94	8:42	9.0	7.0	190	7.0		

## In situ Respiration Data - FE Warren AF (12-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
13-s	12/3/94	15:55	21.8	10.5	260	3.0		pure O2 test well
13-s	12/4/94	9:06	23.8	10.6				
13-s	12/5/94	9:25	24.2	10.3				
13-s	12/6/94	10:44	24.5	9.8				
13-s	12/7/94	11:40	24.0	10.5				
13-s	12/8/94	8:20	23.2	9.7				
13-m	12/3/94	15:55	24.2	12.8	170	3.0	12.4 12.0 11.6 11.5	pure O2 test well
13-m	12/4/94	9:06	36.0	13.3				
13-m	12/5/94	9:25	29.0	12.4				
13-m	12/6/94	10:44	29.0	12.7				
13-m	12/7/94	11:40	24.8	12.8				
13-m	12/8/94	8:20	23.7	11.8				
13-d	12/3/94	15:55	44.5	14.5	60			pure O2 test well
13-d	12/4/94	9:06	41.0	14.7				
13-d	12/5/94	9:25	37.0	14.3				
13-d	12/6/94	10:44	35.5	12.5				
13-d	12/7/94	11:40	33.0	14.5				
13-d	12/8/94	8:20	33.6	13.8				

14-s	12/3/94	15:50	14.0	6.0	50			pure O2 test well
14-s	12/4/94	9:38	20.0	6.0				
14-s	12/5/94	10:00	20.3	5.6				
14-s	12/6/94	10:25	20.5	5.8				
14-s	12/7/94	11:50	20.4	5.8				
14-s	12/8/94	7:54	20.3	5.7				
14-m	12/3/94	15:50	18.4	8.3	100		14.0 13.7 13.5 14.4 13.1 13.9	pure O2 test well Ambient Temp 1 C
14-m	12/4/94	9:38	19.6	8.3				
14-m	12/5/94	10:00	20.3	8.0				
14-m	12/6/94	10:25	20.5	7.8				
14-m	12/7/94	11:50	20.3	8.2				
14-m	12/8/94	7:54	20.0	7.8				
14-d	12/3/94	15:50	21.5	9.4	100	35.0		pure O2 test well
14-d	12/4/94	9:38	22.0	10.0				
14-d	12/5/94	10:00	22.3	10.0				
14-d	12/6/94	10:25	22.3	9.2				
14-d	12/7/94	11:50	21.5	10.0				
14-d	12/8/94	7:54	20.9	9.8				
18-s	12/3/94	15:30	13.5	8.0	40	7.5		pure O2 test well
18-s	12/4/94	9:55	14.0	8.2	120			
18-s	12/5/94	9:16	14.0	7.8				
18-s	12/6/94	10:35	14.5	7.8				
18-s	12/7/94	11:28	14.5	8.3				
18-s	12/8/94	8:12	14.8	7.7				
18-m	12/3/94	15:30	12.5	8.9	120	7.0	13.7 13.6 14.2 13.5 14.4	pure O2 test well
18-m	12/4/94	9:55	13.0	8.8				
18-m	12/5/94	9:16	13.3	8.5				
18-m	12/6/94	10:35	13.5	8.5				
18-m	12/7/94	11:28	13.0	9.3				
18-m	12/8/94	8:12	13.8	8.4				

## In situ Respiration Data - FE Warren A (12-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
18-d	12/3/94	15:30	11.5	9.8		7.0		pure O2 test well
18-d	12/4/94	9:55	12.2	9.8				
18-d	12/5/94	9:16	12.7	9.0				
18-d	12/6/94	10:35	12.7	9.4				
18-d	12/7/94	11:28	12.5	12.5				
18-d	12/8/94	8:12	13.0	9.6				

19-s	12/3/94	15:42	19.3	9.5	120	7.5		pure O2 test well  Ambient Temp -10 C
19-s	12/4/94	9:45	19.0	10.2				
19-s	12/5/94	10:08	17.7	10.0				
19-s	12/6/94	10:18	16.5	9.5				
19-s	12/7/94	11:20	16.7	9.5				
19-s	12/8/94	8:04	17.3	8.5				
19-m	12/3/94	15:42	20.8	12.2	110	7.0		pure O2 test well
19-m	12/4/94	9:45	19.4	12.0				
19-m	12/5/94	10:08	17.0	12.2				
19-m	12/6/94	10:18	16.0	11.0				
19-m	12/7/94	11:20	16.0	10.5				
19-m	12/8/94	8:04	15.7	11.3				
19-d	12/3/94	15:42	22.5	12.5		7.0		pure O2 test well
19-d	12/4/94	9:45	20.7	0.2				
19-d	12/5/94	10:08	17.6	10.5				
19-d	12/6/94	10:18	16.5	11.0				
19-d	12/7/94	11:20	16.1	13.0				
19-d	12/8/94	8:04	15.7	12.8				

28-s	12/7/94	12:15	15.0	5.0				
28-s	12/8/94	8:43	15.0	5.2				
28-m	12/7/94	12:15	13.7	6.4			13.6	
28-m	12/8/94	8:43	13.5	6.5			13.2	
28-d	12/7/94	12:15	14.0	5.7				
28-d	12/8/94	8:43	14.0	5.8				
29-s	10/13/94		14.5	4.5				
29-s	10/14/94		14.2	5.7				
29-s	10/15/94		13.5	5.5				
29-s	10/16/94		11.0	7.0				
29-s	10/17/94		6.8	10.5				
29-m	10/13/94		14.0	4.5				
29-m	10/14/94		11.8	6.2				
29-m	10/15/94		11.5	6.3				
29-m	10/16/94		7.5	8.5				
29-m	10/17/94		6.0	9.3				
29-d	10/13/94		17.8	2.0				
29-d	10/14/94		12.4	4.7				
29-d	10/15/94		11.2	6.2				
29-d	10/16/94		6.5	8.8				
29-d	10/17/94		4.5	9.8				

In situ Respiration Data - FE Warren A (12-94)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
33-s	12/7/94	12:11	15.5	5.0				
33-s	12/8/94	8:39	16.0	5.0				
33-m	12/7/94	12:11	11.0	7.5			12.9	
33-m	12/8/94	8:39	11.5	7.5			12.9	
33-d	12/7/94	12:11	0.0	14.5				
33-d	12/8/94	8:39	0.0	14.7				
34-s	12/7/94	12:10	16.5	2.2				
34-s	12/8/94	8:35	17.7	2.4				
34-m	12/7/94	12:10	15.0	2.1			14.6	
34-m	12/8/94	8:35	16	3.3			14.5	
34-d	12/7/94	12:10	13.3	3.6				
34-d	12/8/94	8:35	14.5	4.0				

## In situ Respiration Test Data - FE Warren (3-95)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
3-s	3/6/95	12:20	15.0	2.8	110	3.5	3.8	Thermometer died
3-s	3/7/95	13:50	15.0	2.6	110	7.0	3.9	
3-s	3/8/95	10:36	15.2	2.5	110	6.5	3.5	
3-s	3/9/95	11:38	14.5	2.9	90	6.5	3.6	
3-s	3/10/95	9:37	15.4	3.1	80	6.5		
3-m	3/6/95	12:20	14.2	3.3	120	3.0	7.0	
3-m	3/7/95	13:50	13.8	3.0	120	6.5	6.9	
3-m	3/8/95	10:36	13.8	3.0	120	3.0	6.7	
3-m	3/9/95	11:38	13.2	3.4	10	3.0	7.0	
3-m	3/10/95	9:37	13.6	3.6	76	6.0		
3-d	3/6/95	12:20	13.8	3.4	120	3.0		
3-d	3/7/95	13:50	14.2	2.9	120	6.5		
3-d	3/8/95	10:36	14.7	2.6	120	6.0		
3-d	3/9/95	11:38	12.8	3.7	100	3.0		
3-d	3/10/95	9:37	13.0	3.7	83	6.5		

4-s	3/6/95	12:15	13.7	5.0	150	6.0	5.0	
4-s	3/7/95	13:45	12.8	4.7	140	3.0	5.1	
4-s	3/8/95	10:30	12.5	5.3	110	6.0	4.6	
4-s	3/9/95	11:34	12.6	5.7	120	2.5	4.7	
4-s	3/10/95	9:34	13.5	5.5	100	7.0		
4-m	3/6/95	12:15	10.7	6.9	150	6.5	9.4	
4-m	3/7/95	13:45	10.8	6.8	140	6.0	9.6	
4-m	3/8/95	10:30	11.0	6.4	120	3.5	9.7	
4-m	3/9/95	11:34	10.6	7.0	130	3.0	9.3	
4-m	3/10/95	9:34	12.0	6.8	100	6.5		
4-d	3/6/95	12:15	10.4	7.2	150	6.5	7.9	
4-d	3/7/95	13:45	9.5	7.6	140	6.0	7.4	
4-d	3/8/95	10:30	9.5	8.0	120	7.0	6.9	
4-d	3/9/95	11:34	10.0	7.5	130	3.0	7.0	
4-d	3/10/95	9:34	10.5	8.0	100	6.0		

Italics indicate 1:1 dilution

5-s	3/6/95	12:45	18.2	3.0	100	3.0	4.0	
5-s	3/7/95	13:35	17.0	2.8	100	2.5	3.8	
5-s	3/8/95	10:20	17.5	2.7	100	2.5	3.5	
5-s	3/9/95	11:30	15.8	3.9	110	3.0	3.4	
5-s	3/10/95	9:31	16.2	4.0	100	2.5		
5-m	3/6/95	12:45	11.0	7.5	130	5.0	5.6	
5-m	3/7/95	13:35	10.0	7.7	110	3.0	5.5	
5-m	3/8/95	10:20	10.5	7.1	120	3.0	5.2	
5-m	3/9/95	11:30	10.3	7.6	120	3.0	8.5	
5-m	3/10/95	9:31	10.6	7.9	100	2.5		
5-d	3/6/95	12:45	7.0	10.3	130	3.0		
5-d	3/7/95	13:35	7.5	9.5	120	3.0		
5-d	3/8/95	10:20	9.0	8.0	120	6.5		
5-d	3/9/95	11:30	6.5	10.2	120	6.5		
5-d	3/10/95	9:31	7.0	11.0	110	3.0		

Italics indicate 1:1 dilution

In situ Respiration Test Data - FE Warren FB (3-95)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
6-s	3/6/95	12:50	16.8	4.3	120	3.0	5.2	
6-s	3/7/95	13:30	17.5	3.7	120	6.5	4.5	
6-s	3/8/95	10:15	15.3	4.9	120	2.5	4.2	
6-s	3/9/95	11:25	15.3	5.3	120	2.5	3.9	
6-s	3/10/95	9:28	15.5	5.4	110	6.5		
6-m	3/6/95	12:50	15.0	6.2	130	9.0	7.0	
6-m	3/7/95	13:30	15.0	5.6	140	7.0	8.8	
6-m	3/8/95	10:15	14.4	5.6	120	3.0	8.8	
6-m	3/9/95	11:25	14.4	6.2	120	3.0	8.5	
6-m	3/10/95	9:28	14.8	6.0	110	3.5		
6-d	3/6/95	12:50	14.0	6.5	130	3.0	6.6	
6-d	3/7/95	13:30	13.5	6.5	130	7.0	6.4	
6-d	3/8/95	10:15	14.3	5.6	120	3.0	6.1	
6-d	3/9/95	11:25	13.6	6.7	120	2.5	5.8	
6-d	3/10/95	9:28	13.7	6.8	110	2.5		

10-s	3/6/95	12:10	16.5	4.8	140	3.0		
10-s	3/7/95	13:15	16.8	4.4	130	3.0		
10-s	3/8/95	10:03	16.8	4.0	110	2.5		
10-s	3/9/95	11:16	16.5	4.7	130	2.5		
10-s	3/10/95	9:20	17.0	4.7	110	6.5		
10-m	3/6/95	12:10	15.6	5.8	140	3.0	9.1	
10-m	3/7/95	13:15	15.4	5.8	140	3.0	8.8	
10-m	3/8/95	10:03	15.5	5.3	110	2.5	8.6	
10-m	3/9/95	11:16	15.3	5.8	120	3.0	8.6	
10-m	3/10/95	9:20	16.0	5.6	100	2.5		
10-d	3/6/95	12:10	15.0	6.5	130	3.5		
10-d	3/7/95	13:15	15.0	6.5	140	3.5		
10-d	3/8/95	10:03	14.5	6.0	120	7.5		
10-d	3/9/95	11:16	14.5	6.5	130	3.0		
10-d	3/10/95	9:20	15.2	6.3	110	7.0		

11-s	3/6/95	12:04	14.8	6.2	140	6.5		
11-s	3/7/95	10:20	13.8	6.5	140	3.0		
11-s	3/8/95	10:08	14.0	6.0	120			
11-s	3/9/95	11:21	14.0	6.3	130	2.5		
11-s	3/10/95	9:24	14.9	6.0	110	2.5		
11-m	3/6/95	12:04	12.0	8.5	140	3.0	7.8	
11-m	3/7/95	10:20	11.0	8.5	150	6.5		
11-m	3/8/95	10:08	11.5	7.8	120	6.5		
11-m	3/9/95	11:21	11.2	8.5	130	3.0		
11-m	3/10/95	9:24	11.8	8.8	110	6.5		<i>Italics indicate 1:1 dilution</i>
11-d	3/6/95	12:04	8.0	12.0	130	3.0		
11-d	3/7/95	10:20	6.7	12.0	150	3.0		
11-d	3/8/95	10:08	7.7	11.0	130	7.0		
11-d	3/9/95	11:21	6.3	12.5	130	3.0		
11-d	3/10/95	9:24	6.8	13.0	120	6.5		



In situ Respiration Test Data - FE Warre B (3-95)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
13-s	3/6/95	11:55	18.0	3.3	130	3.0		
13-s	3/7/95	11:55	16.5	3.3	110	6.0		
13-s	3/8/95	9:46	17.5	2.8	100	3.0		
13-s	3/9/95	11:00	16.0	3.8	120	6.5		
13-s	3/10/95	9:02	16.2	3.8	110	2.5		
13-m	3/6/95	11:55	17.0	3.7	110	3.0	7.6	
13-m	3/7/95	11:55	16.3	3.5	130	6.5	8.3	
13-m	3/8/95	9:46	16.0	3.5	110	3.0	7.2	
13-m	3/9/95	11:00	15.5	4.0	120	6.5	7.9	
13-m	3/10/95	9:02	15.4	4.0	110	2.5		
13-d	3/6/95	11:55	16.8	3.0	100	3.0		
13-d	3/7/95	11:55	15.7	2.8	120	6.5		
13-d	3/8/95	9:46	15.8	2.7	110	6.0		
13-d	3/9/95	11:00	15.0	3.5	110	3.0		
13-d	3/10/95	9:02	14.9	3.6	110	3.0		

14-s	3/6/95	11:50	18.5	3.4	100	3.0		
14-s	3/7/95	12:00	19.0	2.2	100	6.0		
14-s	3/8/95	9:40	18.5	2.7	100	3.0		
14-s	3/9/95	10:50	17.8	3.3	100	7.5		
14-s	3/10/95	8:58	18.2	3.3	110	2.5		
14-m	3/6/95	11:50	no flow	no flow		20.0	7.7	
14-m	3/7/95	12:00	17.6	3.6	120	21.0	8.6	Very low flow
14-m	3/8/95	9:40	17.3	3.7	120	3.0	8.2	
14-m	3/9/95	10:50	17.0	4.0	100	3.0	8.2	
14-m	3/10/95	8:58	17.3	4.2	110	2.5		
14-d	3/6/95	11:50	17.2	4.3	110	3.0		
14-d	3/7/95	12:00	16.6	4.2	110	6.5		
14-d	3/8/95	9:40	16.6	4.0	110	6.5		
14-d	3/9/95	10:50	16.5	4.3	110	4.0		
14-d	3/10/95	8:58	16.7	4.5	110	2.5		

15-s	3/6/95	11:24	18.6	2.7	100	3.0		
15-s	3/7/95	1:05	18.0	2.5	110	3.0		
15-s	3/8/95	9:57	18.0	2.3	100	6.0		
15-s	3/9/95	11:13	18.5	2.5	120	3.0		
15-s	3/10/95	9:09	18.5	3.7	85	2.5		
15-m	3/6/95	11:24	17.7	3.2	110	3.0	7.5	
15-m	3/7/95	1:05	17.5	3.0	110	2.5	7.6	
15-m	3/8/95	9:57	17.3	3.0	100	6.0	7.2	
15-m	3/9/95	11:13	17.3	3.3	130	6.5	7.2	
15-m	3/10/95	9:09	17.5	3.4	90	2.5		
15-d	3/6/95	11:24	17.5	3.5	110	3.0		
15-d	3/7/95	1:05	17.3	3.0	120			
15-d	3/8/95	9:57	17.3	2.9	100	6.0		
15-d	3/9/95	11:13	17.0	3.5	130	3.0		
15-d	3/10/95	9:09	17.5	3.5	95	3.0		

## In situ Respiration Test Data - FE Warren AFB (3-95)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump (in Hg)	Temp (C)	Comments
16-s	3/6/95	11:29	17.4	3.7	120	6.0		
16-s	3/7/95	1:00	16.7	3.3	110	3.0		
16-s	3/8/95	9:50	17.2	3.0	110	2.5		
16-s	3/9/95	11:04	16.7	3.7	110	3.0		
16-s	3/10/95	9:06	17.0	3.8	100	3.0		
16-m	3/6/95	11:29	16.5	4.0	130	6.5		
16-m	3/7/95	1:00	16.3	3.9	130	3.0		
16-m	3/8/95	9:50	16.2	3.7	120	2.5		
16-m	3/9/95	11:04	16.2	4.0	120	6.5		
16-m	3/10/95	9:06	16.5	4.2	100	2.5		
16-d	3/6/95	11:29	16.0	4.2	130	6.0		
16-d	3/7/95	1:00	16.0	4.0	120	3.0		
16-d	3/8/95	9:50	16.2	3.7	110	2.5		
16-d	3/9/95	11:04	16.0	4.3	120	7.0		
16-d	3/10/95	9:06	16.4	4.3	100	2.5		

18-s	3/6/95	11:39	16.5	4.5	120	3.0		
18-s	3/7/95	11:40	15.7	4.2	130	3.5		
18-s	3/8/95	9:23	15.7	4.8	110	3.0		
18-s	3/9/95	11:08	15.4	4.6	140	3.0		
18-s	3/10/95	8:50	15.5	4.7	120	7.0		
18-m	3/6/95	11:39	15.6	4.7	120	3.0	9.4	
18-m	3/7/95	11:40	15.0	4.6	140	3.0	9.5	
18-m	3/8/95	9:23	14.7	4.7	130	3.5	8.7	
18-m	3/9/95	11:08	14.5	5.3	150	3.0	8.9	
18-m	3/10/95	8:50	14.7	5.3	120	2.5		
18-d	3/6/95	11:39	15.2	4.7	130	3.0		
18-d	3/7/95	11:40	14.5	4.6	140	3.0		
18-d	3/8/95	9:23	14.5	4.6	130	3.0		
18-d	3/9/95	11:08	14.0	5.3	150	3.0		
18-d	3/10/95	8:50	14.0	5.6	120	2.5		

19-s	3/6/95	11:44	17.9	3.0	100	2.5		
19-s	3/7/95	11:45	16.7	3.0	120	3.0		
19-s	3/8/95	9:30	16.5	2.8	110	3.0		
19-s	3/9/95	10:47	16.0	3.3	110	2.5		
19-s	3/10/95	8:54	15.8	3.7	110	2.5		
19-m	3/6/95	11:44	17.0	3.3	100	3.0		
19-m	3/7/95	11:45	16.2	3.3	110	3.0		
19-m	3/8/95	9:30	15.4	3.3	110	3.0		
19-m	3/9/95	10:47	14.7	3.8	100	2.5		
19-m	3/10/95	8:54	14.8	4.0	120	2.5		
19-d	3/6/95	11:44	17.2	3.0	100	7.0		
19-d	3/7/95	11:45	16.2	3.0	110	3.5		
19-d	3/8/95	9:30	16.0	2.9	120	2.5		
19-d	3/9/95	10:47	14.6	3.7	100	3.0		
19-d	3/10/95	8:54	14.6	3.8	120	2.5		

## In situ Respiration Test Data - FE Warren FB (3-95)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
27-s	3/6/95	10:35	16.5	4.5	120	3.0		
27-s	3/7/95	11:30	16.0	4.5	120	3.0		
27-s	3/8/95	9:16	16.4	3.5	120	3.0		
27-s	3/9/95	10:41	15.8	4.3	130	3.0		
27-s	3/10/95	8:38	16.5	4.5	120	7.0		
27-m	3/6/95	10:35	13.5	7.0	130	7.0	8.2	
27-m	3/7/95	11:30	12.5	7.0	130	3.5	8.0	
27-m	3/8/95	9:16	13.0	6.0	130	3.0	7.4	
27-m	3/9/95	10:41	13.0	6.3	120	3.0	7.4	
27-m	3/10/95	8:38	13.7	6.7	130	7.0		
27-d	3/6/95	10:35	12.8	7.4	130	7.0		
27-d	3/7/95	11:30	11.8	7.4	130	3.0		
27-d	3/8/95	9:16	12.5	6.0	130	3.0		
27-d	3/9/95	10:41	12.4	6.7	120	3.0		
27-d	3/10/95	8:38	12.5	6.9	120	6.5		

28-s	3/6/95	10:40	14.8	4.7	130	6.5		
28-s	3/7/95	11:25	9.8	7.5	130	3.5		
28-s	3/8/95	9:11	10.2	5.6	120	3.0		
28-s	3/9/95	10:37	12.0	6.6	120	3.0		
28-s	3/10/95	8:34	13.0	6.6	130	3.0		
28-m	3/6/95	10:40	9.0	10.2	140	3.0	9.5	
28-m	3/7/95	11:25	7.0	10.0	140	3.0	9.3	
28-m	3/8/95	9:11	8.0	8.5	110	3.0	9.0	
28-m	3/9/95	10:37	8.5	9.4	130			Italics indicate 1:1 dilution
28-m	3/10/95	8:34	8.5	9.5	130	6.0		
28-d	3/6/95	10:40	3.5	15.5	140	7.0		
28-d	3/7/95	11:25	1.8	14.0	130	3.0		
28-d	3/8/95	9:11	3.0	12.5	120	3.0		
28-d	3/9/95	10:37	4.4	12.3	140	3.0		Italics indicate 1:1 dilution
28-d	3/10/95	8:34	4.5	12.8	130	6.0		

29-s	3/6/95	10:45	12.0	6.3	130	7.0		
29-s	3/7/95	11:20	12.5	6.0	110	3.0		
29-s	3/8/95	9:06	12.6	5.7	110	3.0		
29-s	3/9/95	10:32	13.0	6.2	130	6.5		
29-s	3/10/95	8:30	14.0	5.6	130	3.0		
29-m	3/6/95	10:45	8.0	10.2	130	6.5	8.0	
29-m	3/7/95	11:20	6.5	9.5	120	3.0	7.6	
29-m	3/8/95	9:06	7.2	9.0	120	3.0	8.1	
29-m	3/9/95	10:32	7.2	9.3	140	3.0	7.6	Italics indicate 1:1 dilution
29-m	3/10/95	8:30	7.8	9.4	130	3.0		
29-d	3/6/95	10:45	5.7	12.5	130	7.0		
29-d	3/7/95	11:20	3.8	12.0	130	3.0		
29-d	3/8/95	9:06	5.5	9.8	120	3.0		
29-d	3/9/95	10:32	4.5	11.2	130	3.0		Italics indicate 1:1 dilution
29-d	3/10/95	8:30	5.3	11.5	130	3.0		

## In situ Respiration Test Data - FE Warren FB (3-95)

Sampling Point	Date	Time	O2 (%)	CO2 (%)	TPH (ppm)	Pump Press (in Hg)	Temp (C)	Comments
32-s	3/6/95	9:40	54.9	.9	150	21.0		very low flow
32-s	3/7/95	10:40	58.5	1.7	120	20.0		
32-s	3/8/95	8:30	31.5	1.5	90	6.5		
32-s	3/9/95	10:00	32.0	1.9	90	10.0		
32-s	3/10/95	8:17	21.5	2.5	100	20.0		
32-m	3/6/95	9:40	45.9	2.5	130	14.0	9.0	low flow
32-m	3/7/95	10:40	48.5	2.5	130	12.0	9.3	
32-m	3/8/95	8:30	40.0	3.2	120	8.0	9.6	
32-m	3/9/95	10:00	15.5	3.8	130	7.5	8.4	
32-m	3/10/95	8:17	12.3	4.7	120	13.0		
32-d	3/6/95	9:40	37.0	2.3	150	6.5		1:2 Dilution  No purge Italics indicate 1:1 dilution
32-d	3/7/95	10:40	57.0	2.2	120	6.0		
32-d	3/8/95	8:30	37.5	3.5	220	6.5		
32-d	3/9/95	10:00	7.5	4.7	270	3.0		
32-d	3/10/95	8:17	8.8	4.7	240	6.0		

33-s	3/6/95	9:30	17.5	4.3	140	7.0		
33-s	3/7/95	11:00	17.0	4.0	110	6.0		
33-s	3/8/95	8:55	17.5	3.6	110	2.5		
33-s	3/9/95	10:20	17.5	3.7	120	2.5		
33-s	3/10/95	8:20	17.8	3.8	120	6.5		
33-m	3/6/95	9:30	15.7	5.6	160	6.5	9.3	
33-m	3/7/95	11:00	15.0	5.8	120	4.0	9.3	
33-m	3/8/95	8:55	15.7	4.8	120	3.5	9.0	
33-m	3/9/95	10:20	15.6	5.3	130	3.5	8.8	
33-m	3/10/95	8:20	16.0	5.3	120	7.5		
33-d	3/6/95	9:30	.8	13.0	900	6.0		
33-d	3/7/95	11:00	.0	12.5	1,000	6.0		
33-d	3/8/95	8:55	.5	11.8	1,000	5.5		
33-d	3/9/95	10:20	.2	11.2	600	5.0		
33-d	3/10/95	8:20	.5	12.0	500	9.5		

34-s	3/6/95	9:25	16.0	5.5	140	6.5		
34-s	3/7/95	11:10	14.0	6.5	130	6.5		
34-s	3/8/95	9:00	15.0	5.5	130	3.0		
34-s	3/9/95	10:27	15.0	5.8	130	2.5		
34-s	3/10/95	8:25	15.4	5.6	100	2.5		
34-m	3/6/95	9:25	14.5	7.0	140	6.5	10.7	
34-m	3/7/95	11:10	11.5	7.5	130	6.0		
34-m	3/8/95	9:00	13.8	6.5	130	3.0	10.0	
34-m	3/9/95	10:27	13.5	7.2	120	3.0	9.8	
34-m	3/10/95	8:25	14.0	7.0	130	3.0		
34-d	3/6/95	9:25	12.5	8.8	150	7.0		
34-d	3/7/95	11:10	11.2	8.8	140	7.0		
34-d	3/8/95	9:00	12.5	7.3	120	3.0		
34-d	3/9/95	10:27	12.3	8.0	110	2.5		
34-d	3/10/95	8:25	12.5	7.8	110	2.5		

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**APPENDIX 18**  
**RESPIRATION TEST REGRESSION RESULTS**

Respiration Monitoring Points	Depth (ft)	Mean O2 Uptake Rate (%/hr)	95% CI	p Value	Mean CO2 Production Rate (%/hr)	95% CI	p Value
1	3	0.0162	NS	0.1362	-0.0177	NS	0.1188
	5.5	0.0123	NS	0.4895	-0.0161	NS	0.4918
	8	0.0304	0.0088	0.0145	-0.051	0.0118	0.0116
2	3	0.0013	NS	0.8252	-0.0104	NS	0.2122
	5.5	-0.0112	NS	0.2142	-0.0054	NS	0.6002
	8	-0.0225	0.0222	0.0475	-0.0033	NS	0.7661
3	3	0.017	NS	0.0846	-0.0147	NS	0.1173
	5.5	-0.0098	NS	0.4259	-0.0069	NS	0.448
	8	-0.0055	NS	0.6308	-0.0069	NS	0.6169
4	3	-0.0373	0.0303	0.0237	-0.0001	NS	0.9941
	5.5	-0.0376	0.0375	0.0502	0.0025	NS	0.8096
	8	-0.089	0.06	0.0125	0.043	0.042	0.0473
5	3	-0.0179	NS	0.4148	-0.0038	NS	0.7461
	5.5	-0.0194	NS	0.3293	-0.0181	NS	0.5231
	8	need more data					
6	3	-0.0173	0.0161	0.0392	-0.0049	NS	0.5676
	5.5	-0.0242	0.0193	0.0219	-0.0069	NS	0.7291
	8	-0.0322	0.0267	0.0257	0.0032	NS	0.7705
7	3	-0.0041	NS	0.9062	-0.0047	NS	0.5674
	5.5	-0.0096	0.0088	0.0374	-0.0027	NS	0.5794
	8	-0.0116	0.0062	0.0038	0.0004	NS	0.9132
8	3	0.0042	NS	0.2649	-0.008	NS	0.1629
	5.5	-0.0041	NS	0.4139	-0.0022	NS	0.6991
	8	-0.0093	NS	0.1227	-0.0014	NS	0.787
9	3	-0.005	0.004	0.0191	-0.00006	NS	0.9814
	5.5	-0.011	0.004	0.0012	0.001	NS	0.6767
	8	-0.0193	0.0125	0.0092	0.0007	NS	0.7115
10	3	-0.0105	NS	0.01195	-0.0076	NS	0.4033
	5.5	-0.0191	0.0153	0.0225	0.0001	NS	0.9942
	8	-0.0243	0.0156	0.009	0.0129	NS	0.0526
11	3	-0.0229	0.0216	0.0409	-0.0009	NS	0.9255
	5.5	-0.0557	0.0336	0.0066	0.0055	NS	0.7033
	8	need more data					
12	3	-0.009	NS	0.1331	-0.0049	NS	0.4308
	5.5	-0.0213	0.0131	0.0074	0.0003	NS	0.9592
	8	-0.0253	0.0123	0.0024	0.0047	NS	0.3952
13	3	-0.0311	0.0194	0.0078	0.0014	NS	0.8236
	5.5	-0.0336	0.0135	0.0009	0.0029	NS	0.5751
	8	-0.0445	0.0097	0.0001	0.0071	NS	0.3851
14	3	-0.007	0.006	0.0247	-0.0016	NS	0.7201
	5.5	-0.019	0.0085	0.0016	-0.0042	NS	0.4499
	8	-0.0212	0.0096	0.0016	0.0027	NS	0.5364
15	3	-0.0068	0.0066	0.0447	-0.0107	NS	0.1143
	5.5	-0.0083	0.0077	0.0383	-0.0015	NS	0.7548
	8	-0.0114	0.0045	0.0008	0.0051	NS	0.1711
16	3	-0.0041	NS	0.5267	0.0018	NS	0.7486
	5.5	-0.0177	NS	0.0532	-0.0013	NS	0.8732
	8	-0.0149	0.0102	0.0118	0.0065	0.0062	0.0414
17	3	-0.0233	0.0116	0.0027	-0.0002	NS	0.9754
	5.5	-0.0192	0.014	0.0155	0.0075	NS	0.1306
	8	-0.026	0.0082	0.0002	0.0187	0.0096	0.0031

Respiration Monitoring		Mean O2 Uptake Rate			Mean CO2 Production Rate		
Points	Depth (ft)	(%/hr)	95% CI	p Value	(%/hr)	95% CI	p Value
18	3	-0.0065	NS	0.4422	-0.013	NS	0.2049
	5.5	-0.0246	0.0228	0.0384	-0.0007	NS	0.9481
	8	-0.036	0.026	0.0171	0.0032	NS	0.8045
19	3	-0.0376	0.0116	0.0002	0.0084	NS	0.2055
	5.5	-0.0437	0.012	0.0001	0.0075	NS	0.1419
	8	-0.047	0.01	0.0001	0.0164	NS	0.0941
20	3	-0.0059	0.0037	0.0082	-0.002	NS	0.3992
	5.5	-0.0057	NS	0.076	0.0002	NS	0.8881
	8	-0.0093	0.0047	0.0028	0.0009	NS	0.1302
21	3	-0.0038	NS	0.154	-0.0017	NS	0.5539
	5.5	-0.0038	NS	0.0858	-0.0022	NS	0.4149
	8	-0.0086	0.0046	0.0037	0.0001	NS	0.8575
22	3	-0.0074	NS	0.1871	-0.0001	NS	0.9794
	5.5	-0.0116	NS	0.0865	0.0036	NS	0.2931
	8	-0.0194	0.0074	0.0007	0.0051	NS	0.052
23	3	-0.0102	0.0097	0.0423	-0.0004	NS	0.9229
	5.5	-0.0255	0.0095	0.0006	-0.001	NS	0.8061
	8	-0.0319	0.0092	0.0002	0.0106	NS	0.08889
24	3	-0.0242	0.0217	0.0343	0.001	NS	0.8539
	5.5	-0.0381	0.0117	0.0002	0.0058	NS	0.3111
	8	-0.0423	0.0103	0.0001	0.0133	NS	0.1353
25	3	-0.0029	NS	0.02116	0.0008	NS	0.8737
	5.5	-0.0017	NS	0.4732	-0.0005	NS	0.8684
	8	-0.0046	NS	0.0583	0.0004	NS	0.7411
26	3	-0.0054	NS	0.0558	0.0011	NS	0.6401
	5.5	-0.0076	0.0052	0.0114	0.0003	NS	0.7934
	8	-0.0085	0.0058	0.0118	0.0014	NS	0.173
27	3	-0.0238	0.0142	0.0063	-0.0034	NS	0.6344
	5.5	-0.0499	0.0147	0.0002	0.0107	NS	0.1708
	8	-0.0525	0.0319	0.0069	0.0298	0.01	0.0003
28	3	need more data					
	5.5	need more data					
	8	need more data					
29	3	-0.063	0.043	0.0133	0.0056	NS	0.6155
	5.5	-0.0869	0.0273	0.0002	-0.015	NS	0.3853
	8	-0.2245	0.14	0.0112	0.0708	0.0491	0.0161
30	3	-0.0016	NS	0.5323	-0.0007	NS	0.5739
	5.5	0.0011	NS	0.7551	0.0004	NS	0.6716
	8	-0.0007	NS	0.8263	0.0006	NS	0.6628
31	3	-0.0001	NS	0.9809	-0.0017	NS	0.1919
	5.5	0.0059	NS	0.1672	-0.0009	NS	0.378
	8	0.0012	NS	0.7333	-0.0012	NS	0.4807
32	3	-0.0131	NS	0.0527	0.0054	NS	0.2996
	5.5	-0.0164	NS	0.2794	-0.0161	NS	0.457
	8	need more data					
33	3	0.0428	0.0218	0.003	-0.033	0.0257	0.0201
	5.5	0.0431	0.0221	0.0031	-0.0289	NS	0.0798
	8	need more data					
34	3	-0.0333	0.0078	0.0002	0.003	NS	0.4859
	5.5	-0.0465	0.0142	0.0002	-0.00034	NS	0.9575
	8	-0.0547	0.0138	0.0001	0.015	0.012	0.0263

Note: NS = Non-Significant



Respiration Monitoring		Mean			Mean CO2		
Points	Depth (ft)	O2 Uptake Rate (1/hr)	95% CI	p Value	Production Rate (1/hr)	95% CI	p Value
1	3	0.0012	NS	0.1647	-0.0009	NS	0.836
	5.5	0.0014	NS	0.43	-0.0014	NS	0.5654
	8	0.0046	0.0006	0.0068	-0.0041	0.0005	0.0072
2	3	0.0001	NS	0.8276	-0.0023	NS	0.2311
	5.5	-0.0007	NS	0.2086	-0.0008	NS	0.6732
	8	-0.0016	0.0015	0.0417	-0.0004	NS	0.8385
3	3	0.001	NS	0.0891	-0.003	NS	0.1302
	5.5	-0.0006	NS	0.4103	-0.0011	NS	0.5109
	8	-0.0003	NS	0.6296	-0.0009	NS	0.7463
4	3	-0.0027	0.002	0.0176	0.0002	NS	0.9339
	5.5	-0.0033	0.003	0.0375	0.0005	NS	0.7889
	8	-0.006	0.0056	0.0404	0.0043	NS	0.2692
5	3	-0.0012	NS	0.4202	-0.0005	NS	0.7852
	5.5	-0.0021	NS	0.3196	-0.0012	NS	0.6173
	8	need more data					
6	3	-0.0011	0.001	0.0351	-0.0008	NS	0.6542
	5.5	-0.0016	0.0012	0.018	-0.0009	NS	0.7559
	8	-0.0022	0.0017	0.0199	0.0007	NS	0.7379
7	3	0.00004	NS	0.8901	-0.0014	NS	0.7124
	5.5	-0.0096	0.0005	0.037	-0.0008	NS	0.639
	8	-0.0006	0.0003	0.0037	2	NS	0.8841
8	3	0.0002	NS	0.2636	-0.0022	NS	0.1907
	5.5	-0.0002	NS	0.4148	-0.0005	NS	0.7649
	8	-0.005	NS	0.1183	-0.0003	NS	0.837
9	3	-0.0002	0.0001	0.0186	0.0001	NS	0.9546
	5.5	-0.0006	0.0005	0.0307	0.0008	NS	0.6804
	8	-0.001	0.0007	0.0097	0.0007	NS	0.7105
10	3	-0.0006	NS	0.1151	-0.0014	NS	0.4729
	5.5	-0.0011	0.0009	0.0202	0.0001	NS	0.936
	8	-0.0014	0.0009	0.0076	0.0031	NS	0.0673
11	3	-0.0016	0.0015	0.0387	-0.00004	NS	0.9803
	5.5	-0.0052	0.0028	0.0041	0.0008	NS	0.7296
	8	need more data					
12	3	-0.0005	NS	0.1294	-0.0013	NS	0.5152
	5.5	-0.0012	0.0007	0.0065	0.0002	NS	0.9129
	8	-0.0015	0.0007	0.002	0.0013	NS	0.4158
13	3	-0.0018	0.0011	0.0079	0.0004	NS	0.788
	5.5	-0.002	0.0007	0.0007	0.0008	NS	0.5697
	8	-0.0025	0.0005	0.0001	0.003	NS	0.133
14	3	-0.0004	0.0003	0.0234	-0.0005	NS	0.8085
	5.5	-0.001	0.0004	0.0015	-0.0015	NS	0.4424
	8	-0.0012	0.0005	0.0013	0.001	NS	0.5415
15	3	-0.0004	0.0003	0.043	-0.0055	NS	0.1171
	5.5	-0.0004	0.0004	0.0369	-0.0004	NS	0.852
	8	-0.0006	0.0002	0.0008	0.0031	NS	0.2303
16	3	-0.0002	NS	0.5405	0.001	NS	0.7361
	5.5	-0.0009	-	0.0481	-0.0002	NS	0.9838
	8	-0.0008	0.0006	0.0116	0.0042	NS	0.0659
17	3	-0.0013	0.0006	0.0023	-0.00002	NS	0.9925
	5.5	-0.0011	0.0007	0.0142	0.0026	NS	0.1722
	8	-0.0014	0.0005	0.0002	0.0066	0.0038	0.0052

Respiration Monitoring		Mean O2 Uptake Rate			Mean CO2 Production Rate		
Points	Depth (ft)	(l/hr)	95% CI	p Value	(l/hr)	95% CI	p Value
18	3	-0.0004	NS	0.4437	-0.0024	NS	0.2403
	5.5	-0.0016	0.0014	0.0328	0.00003	NS	0.9853
	8	-0.0024	0.0017	0.0145	0.0008	NS	0.7427
19	3	-0.0022	0.0007	0.0002	0.0024	NS	0.2493
	5.5	-0.0026	0.0007	0.0001	0.0025	NS	0.1815
	8	-0.0027	0.0005	0.0001	0.0094	NS	0.169
20	3	-0.0003	0.0002	0.0081	-0.0016	NS	0.4409
	5.5	-0.0003	NS	0.0735	0.0003	NS	0.8258
	8	-0.0005	0.0002	0.0027	0.0015	NS	0.1347
21	3	-0.0002	NS	0.1533	-0.001	NS	0.631
	5.5	-0.0002	NS	0.0851	-0.0017	NS	0.4463
	8	-0.0004	0.0002	0.0035	0.0002	NS	0.8601
22	3	-0.0004	NS	0.1819	0.0001	NS	0.9595
	5.5	-0.0006	NS	0.0847	0.0019	NS	0.3392
	8	-0.001	0.0004	0.0006	0.0038	NS	0.0682
23	3	-0.0005	0.0006	0.0434	-0.0001	NS	0.9712
	5.5	-0.0014	0.0005	0.0005	-0.0003	NS	0.8775
	8	-0.0018	0.0005	0.0001	0.0058	NS	0.069
24	3	-0.0014	0.0012	0.03	0.0004	NS	0.826
	5.5	-0.0022	0.0007	0.0002	0.0021	NS	0.3554
	8	-0.0024	0.0005	0.0001	0.0073	NS	0.1415
25	3	-0.0001	NS	0.2118	0.0007	NS	0.8003
	5.5	-0.0001	NS	0.4714	-0.0001	NS	0.9758
	8	-0.0002	NS	0.0575	0.0006	NS	0.7386
26	3	-0.0003	NS	0.0546	0.0012	NS	0.6221
	5.5	-0.0004	0.0003	0.011	0.0004	NS	0.785
	8	-0.0004	0.0003	0.0114	0.0018	NS	0.1895
27	3	-0.0014	0.0008	0.0059	-0.0006	NS	0.6911
	5.5	-0.0032	0.001	0.0001	0.0025	NS	0.1722
	8	-0.0032	0.002	0.0083	0.0091	0.0042	0.0018
28	3	need more data					
	5.5	need more data					
	8	need more data					
29	3	-0.0049	0.003	0.0087	0.0012	NS	0.5497
	5.5	-0.022	0.007	0.0003	-0.0015	NS	0.6208
	8	-0.0289	0.0091	0.0009	0.013	0.0121	0.0406
30	3	-0.0001	NS	0.5363	-0.001	NS	0.6135
	5.5	0.0001	NS	0.7526	0.0006	NS	0.719
	8	-0.00004	NS	0.8282	0.0011	NS	0.5958
31	3	-0.00003	NS	0.9842	-0.0021	NS	0.2073
	5.5	0.0003	NS	0.166	-0.0012	NS	0.4065
	8	0.0001	NS	0.7253	-0.0014	NS	0.516
32	3	-0.0008	NS	0.051	0.0015	NS	0.3097
	5.5	-0.0022	NS	0.3222	-0.0012	NS	0.4875
	8	need more data					
33	3	0.0031	0.0018	0.0052	-0.0041	0.0028	0.0115
	5.5	0.0038	0.0017	0.0066	-0.0028	NS	0.0711
	8	need more data					
34	3	-0.002	0.0005	0.0001	0.0007	NS	0.4912
	5.5	-0.0031	0.0009	0.0001	-0.0001	NS	0.9214
	8	-0.0039	0.0008	0.0001	0.0034	0.0029	0.0291

Respiration		Mean O2				Mean CO2			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(%/hr)	95% CI	r^2	p Value	rate (%/hr)	95% CI	r^2	p Value
1	3	0.0069	NS	0.2008	0.2655	-0.0021	NS	0.0139	0.7808
	5.5	0.0184	NS	0.1815	0.2926	-0.0130	NS	0.1129	0.4158
	8	-0.4020	NS	0.7081	0.1585	0.3730	NS	0.8043	0.1032
2	3	0.0066	NS	0.2960	0.1633	-0.0051	NS	0.2638	0.1930
	5.5	0.0147	0.0090	0.7264	0.0072	-0.0104	NS	0.3898	0.0980
	8	0.0180	NS	0.4414	0.0723	-0.0116	NS	0.1974	0.2701
3	3	-0.0300	NS	0.1257	0.4353	0.0191	NS	0.0947	0.5020
	5.5	-0.0253	NS	0.1149	0.4571	0.0214	NS	0.1128	0.4613
	8	-0.0167	NS	0.0337	0.6935	0.0239	NS	0.0978	0.4948
4	3	-0.0794	NS	0.2369	0.2680	0.0612	NS	0.2401	0.2643
	5.5	-0.0532	NS	0.1970	0.3185	0.0493	NS	0.2023	0.3112
	8	-0.4383	NS	0.6774	0.1769	0.4029	NS	0.7275	0.1471
5	3	-0.0284	NS	0.4006	0.1271	0.0131	NS	0.1840	0.3369
	5.5	-0.0471	NS	0.1681	0.3610	0.0488	NS	0.2352	0.2700
	8	-0.2325	NS	0.4264	0.2322	0.1833	NS	0.4187	0.2379
6	3	-0.0488	0.0225	0.8611	0.0026	0.0159	NS	0.5642	0.0516
	5.5	-0.0866	0.0751	0.6376	0.0313	0.0362	NS	0.3699	0.1474
	8	-0.0796	0.0774	0.5831	0.0457	0.0434	NS	0.5231	0.0662
7	3	-0.0072	NS	0.1162	0.4086	0.0012	NS	0.0075	0.8386
	5.5	-0.0136	NS	0.3305	0.1360	0.0051	NS	0.1148	0.4117
	8	-0.0168	NS	0.4167	0.0838	0.0064	NS	0.2074	0.2569
8	3	-0.0422	0.0332	0.7574	0.0242	0.0138	NS	0.4614	0.1378
	5.5	-0.0345	0.0270	0.7590	0.0238	0.0130	NS	0.4652	0.1356
	8	-0.0448	0.0290	0.8216	0.0127	0.0192	0.0188	0.6674	0.0472
9	3	-0.0125	NS	0.5937	0.0729	0.0054	NS	0.1453	0.4559
	5.5	-0.0208	0.0139	0.8130	0.0140	0.0024	NS	0.3353	0.2285
	8	-0.0167	0.0122	0.7803	0.0196	0.0010	NS	0.3443	0.2209
10	3	-0.0116	NS	0.4342	0.1546	-0.0001	NS	0.0000	0.9944
	5.5	-0.0310	0.0211	0.8058	0.0152	0.0111	NS	0.4492	0.1452
	8	-0.0567	0.0372	0.8172	0.0134	0.0328	0.0224	0.8055	0.0152
11	3	0.0174	NS	0.3138	0.0922	-0.0108	NS	0.2488	0.1422
	5.5	-0.0452	NS	0.1637	0.3201	0.0485	NS	0.2462	0.2111
	8	-0.0331	NS	0.0985	0.5446	0.0860	NS	0.2878	0.2725
12	3	-0.0192	0.0041	0.9667	0.0001	0.0025	NS	0.4220	0.1143
	5.5	-0.0235	0.0090	0.9003	0.0011	0.0050	0.0049	0.5726	0.0489
	8	-0.0282	0.0128	0.8650	0.0024	0.0090	0.0055	0.7824	0.0082
13	3	-0.1074	0.0608	0.8576	0.0080	0.0418	0.0414	0.6630	0.0486
	5.5	-0.0980	0.0442	0.9047	0.0035	0.0401	NS	0.6301	0.0594
	8	-0.1161	0.0262	0.9742	0.0003	0.0136	NS	0.5818	0.0777
14	3	-0.0203	0.0090	0.9068	0.0034	0.0049	NS	0.5065	0.1127
	5.5	-0.0365	0.0178	0.8913	0.0046	0.0111	0.0098	0.7154	0.0338
	8	-0.0452	0.0170	0.9321	0.0018	0.0151	0.0069	0.9008	0.0038
15	3	-0.0027	NS	0.2770	0.2249	-0.0002	NS	0.0525	0.6213

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (%/hr)	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production rate (%/hr)	95% CI	r <sup>2</sup>	p Value
	5.5	-0.0071	0.0039	0.8128	0.0055	0.0021	0.0020	0.5781	0.0472
	8	-0.0117	0.0051	0.8742	0.0020	0.0052	0.0028	0.8145	0.0054
16	3	-0.0092	0.0053	0.8039	0.0062	0.0037	0.0026	0.7153	0.0165
	5.5	-0.0159	0.0058	0.9084	0.0009	0.0078	0.0049	0.7730	0.0091
	8	-0.0187	0.0055	0.9368	0.0003	0.0084	0.0020	0.9581	0.0001
17	3	-0.0084	0.0075	0.6215	0.0352	0.0028	NS	0.4177	0.1168
	5.5	-0.0133	0.0079	0.7891	0.0075	0.0079	0.0041	0.8270	0.0045
	8	-0.0229	0.0111	0.8480	0.0032	0.0150	0.0039	0.9526	0.0002
18	3	-0.0446	NS	0.5307	0.0633	0.0228	NS	0.3055	0.1982
	5.5	-0.0738	0.0507	0.7371	0.0134	0.0422	0.0340	0.6698	0.0244
	8	-0.1219	0.0578	0.8548	0.0029	0.0488	0.0132	0.9472	0.0002
19	3	-0.0681	0.0253	0.9333	0.0017	0.0176	0.0116	0.8165	0.0135
	5.5	-0.0935	0.0324	0.9415	0.0013	0.0293	0.0109	0.9333	0.0017
	8	-0.0885	0.0180	0.9790	0.0002	0.0285	0.0051	0.9836	0.0001
20	3	-0.0013	NS	0.0753	0.5514	0.0001	NS	0.0198	0.7634
	5.5	-0.0027	NS	0.2232	0.2843	0.0008	0.0003	0.8663	0.0023
	8	-0.0094	0.0029	0.9346	0.0004	0.0014	0.0008	0.7869	0.0077
21	3	-0.0012	NS	0.1244	0.4377	-0.0007	NS	0.1340	0.4194
	5.5	-0.0053	0.0044	0.6609	0.0262	0.0009	NS	0.4745	0.0870
	8	-0.0089	0.0031	0.9152	0.0007	0.0011	0.0010	0.5893	0.0439
22	3	-0.0029	NS	0.1870	0.3325	-0.0012	NS	0.0835	0.5297
	5.5	-0.0180	0.0099	0.8132	0.0055	0.0062	0.0037	0.7609	0.0104
	8	-0.0023	0.0052	0.9509	0.0002	0.0084	0.0740	0.9727	0.0001
23	3	-0.0141	0.0054	0.9030	0.0010	0.0032	NS	0.3556	0.1576
	5.5	-0.0291	0.0067	0.9617	0.0001	0.0059	0.0034	0.7984	0.0067
	8	-0.0379	0.0115	0.9345	0.0004	0.0132	0.0025	0.9734	0.0001
24	3	-0.0410	0.0367	0.7069	0.0360	0.0029	NS	0.0246	0.7666
	5.5	-0.0071	0.0243	0.9428	0.0013	0.0131	NS	0.6531	0.0517
	8	-0.0892	0.0147	0.9861	0.0001	0.0292	0.0117	0.9232	0.0023
25	3	-0.0037	NS	0.0619	0.6345	0.0094	0.0117	0.5539	0.0898
	5.5	-0.0127	0.0080	0.8280	0.0118	0.0029	0.0034	0.5751	0.0805
	8	-0.0089	0.0029	0.9475	0.0011	0.0007	NS	0.1721	0.4135
26	3	-0.0036	0.0033	0.6165	0.0365	0.0021	NS	0.5516	0.0558
	5.5	-0.0066	0.0037	0.8044	0.0062	0.0011	0.0010	0.6303	0.0330
	8	-0.0082	0.0039	0.8528	0.0030	0.0014	0.0007	0.8311	0.0042
27	3	0.0170	NS	0.1192	0.5027	-0.0070	NS	0.0386	0.7091
	5.5	-0.0868	0.0574	0.8150	0.0137	0.0333	NS	0.6437	0.0548
	8	-0.0951	0.0302	0.9504	0.0009	0.0583	0.0220	0.9315	0.0018
28	3	0.0280	0.0263	0.4761	0.0397	-0.0194	NS	0.4047	0.0655
	5.5	-0.0082	NS	0.0077	0.8519	0.0207	NS	0.0361	0.6834
	8	-0.1453	NS	0.2488	0.3924	-0.0485	NS	0.0117	0.8625
29	3	-0.0714	0.0499	0.6211	0.0116	0.0327	NS	0.3811	0.0765
	5.5	-0.1108	0.1061	0.5213	0.0431	0.0582	NS	0.4480	0.0695

Respiration		Mean O <sub>2</sub>				Mean CO <sub>2</sub>			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(%/hr)	95% CI	r <sup>2</sup>	p Value	rate (%/hr)	95% CI	r <sup>2</sup>	p Value
	8	-0.3939	0.2019	0.8342	0.0040	0.2096	0.0723	0.9174	0.0007
30	3	-0.0011	NS	0.0659	0.5784	-0.0002	NS	0.0263	0.7281
	5.5	-0.0065	0.0034	0.8201	0.0050	-3.69E-05	NS	0.0007	0.9535
	8	0.0003	NS	0.0042	0.8905	-0.0009	NS	0.1262	0.4342
31	3	-0.0006	NS	0.3505	0.1614	-0.0002	NS	0.0402	0.6665
	5.5	0.0051	0.0040	0.6833	0.0219	-0.0016	0.0013	0.6810	0.0223
	8	-0.0019	0.0016	0.6442	0.0298	-0.0014	NS	0.4949	0.0778
32	3	-0.0050	0.0004	1.0000	0.0037	0.0019	0.0001	1.0000	0.0037
	5.5	0.0250	0.0092	0.8817	0.0005	-0.0175	0.0138	0.6156	0.0211
	8	-0.0809	NS	0.3787	0.3846	0.0742	NS	0.1311	0.6379
33	3	0.0153	0.0105	0.6757	0.0123	-0.0097	0.0056	0.7514	0.0053
	5.5	0.0170	0.0096	0.7563	0.0050	-0.0108	NS	0.2695	0.1874
	8	0.0218	NS	0.0812	0.4939	-0.0087	NS	0.0542	0.5789
34	3	-0.0927	0.0242	0.9659	0.0004	0.0442	0.0183	0.9189	0.0025
	5.5	-0.1004	0.0241	0.9710	0.0003	0.0475	0.0161	0.9440	0.0012
	8	-0.1295	0.0388	0.9555	0.0008	0.0710	0.0222	0.9521	0.0009

Respiration		Mean O2				Mean CO2			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(%/hr)	95% CI	r <sup>2</sup>	p Value	rate (%/hr)	95% CI	r <sup>2</sup>	p Value
1	3	0.0253	0.0080	0.9696	0.0023	-0.0011	NS	0.0104	0.8702
	5.5	0.0240	0.0180	0.8620	0.0229	0.0030	NS	0.0300	0.8948
	8	0.0120	NS	0.7220	0.0682	0.0020	NS	0.0070	0.4046
2	3	0.0200	NS	0.2430	0.3988	-0.0010	NS	0.2380	0.6181
	5.5	0.0020	NS	0.3570	0.2872	0.0020	NS	0.0930	0.0402
	8	-0.0230	NS	0.5960	0.1261	0.0230	0.0021	0.0810	0.0101
3	3	-0.0260	0.0050	0.9880	0.0050	0.0130	0.0060	0.9460	0.0054
	5.5	-0.0230	0.0200	0.8300	0.0316	0.0120	0.0140	0.7060	0.0749
	8	-0.0180	0.0040	0.9870	0.0006	0.0090	NS	0.6360	0.1060
4	3	-0.0534	0.0063	0.9960	0.0001	0.0166	NS	0.7107	0.0729
	5.5	-0.0760	0.0090	0.9960	0.0001	0.0185	0.0090	0.9232	0.0093
	8	-0.1020	0.0170	0.9920	0.0003	0.0340	0.0046	0.9950	0.0002
5	3	-0.0379	NS	0.1527	0.4437	0.0357	NS	0.3253	0.2372
	5.5	-0.0477	NS	0.1285	0.4853	0.0480	NS	0.4532	0.1428
	8	-0.0544	NS	0.1698	0.4168	0.0613	NS	0.6167	0.0642
6	3	-0.0343	0.0016	0.9990	0.0001	0.0112	0.0042	0.9583	0.0037
	5.5	-0.0514	0.0223	0.9472	0.0052	0.0252	0.0200	0.8452	0.0272
	8	-0.0585	0.0320	0.9190	0.0100	0.0225	0.0052	0.9708	0.0021
7	3	-0.0114	0.0111	0.7766	0.0482	0.0054	0.0052	0.7855	0.0452
	5.5	-0.0082	0.0048	0.9641	0.0181	0.0112	0.0032	0.9908	0.0046
	8	-0.0145	0.0083	0.9127	0.0113	0.0111	0.0033	0.9749	0.0017
8	3	0.0028	NS	0.0860	0.6317	0.0010	NS	0.0010	0.8737
	5.5	-0.0056	NS	0.5196	0.1695	0.0072	NS	0.6769	0.0872
	8	-0.0153	0.0144	0.7928	0.0428	0.0103	0.0025	0.9834	0.0009
9	3	-0.0017	0.0080	0.9310	0.0078	0.0090	0.0050	0.9070	0.0124
	5.5	-0.0170	0.0070	0.9800	0.0100	0.0040	0.0005	0.9980	0.0012
	8	-0.0190	0.0090	0.9780	0.0109	0.0060	0.0020	0.9840	0.0082
10	3	0.0080	NS	0.4280	0.2314	0.0080	0.0050	0.8940	0.0152
	5.5	-0.0010	NS	0.0680	0.6719	0.0100	NS	0.5420	0.1563
	8	-0.0380	0.0360	0.7860	0.0452	0.0350	0.0170	0.9370	0.0068
11	3	-0.0130	0.0050	0.9160	0.0027	-0.0003	NS	0.0050	0.8994
	5.5	-0.0780	NS	0.5720	0.0817	0.0440	NS	0.5710	0.0821
	8	-0.0224	0.0142	0.8940	0.0151	0.1100	0.0280	0.9820	0.0010
12	3	-0.0120	0.0020	0.9910	0.0004	0.0040	0.0030	0.6960	0.0790
	5.5	-0.0160	0.0100	0.8870	0.0166	0.0050	NS	0.6090	0.1193
	8	-0.0220	0.0100	0.9450	0.0055	0.0120	0.0070	0.8960	0.0148
13	3	-0.0290	0.0060	0.9900	0.0004	0.0060	NS	0.6790	0.0860
	5.5	-0.0440	0.0070	0.9910	0.0004	0.0120	0.0050	0.9490	0.0049
	8	-0.0570	0.0060	0.9970	0.0001	0.0140	0.0050	0.9660	0.0027
14	3	-0.0110	0.0080	0.8670	0.0216	0.0400	NS	0.3120	0.3279
	5.5	-0.0220	0.0170	0.8380	0.0292	0.0130	0.0110	0.8220	0.0337
	8	-0.0260	0.0150	0.9630	0.0186	0.0170	0.0130	0.9370	0.0319
15	3	-0.0020	NS	0.2230	0.4220	0.0010	NS	0.0260	0.7973
	5.5	-0.0040	NS	0.5420	0.1561	0.0020	NS	0.1950	0.4572
	8	-0.0100	NS	0.7710	0.0501	0.0030	NS	0.7290	0.0656
16	3	-0.0140	NS	0.6990	0.0778	1.9130	NS	0.6920	0.0805

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (%/hr)	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production rate (%/hr)	95% CI	r <sup>2</sup>	p Value
	5.5	-0.0090	0.0070	0.8370	0.0293	0.0060	0.0010	0.9790	0.0013
	8	-0.0150	0.0080	0.9190	0.0101	0.0050	0.0020	0.9220	0.0095
17	3	-0.0290	NS	0.6820	0.0849	0.0200	NS	0.6130	0.1172
	5.5	-0.0230	0.0170	0.8630	0.0224	0.0130	0.0090	0.8760	0.0192
	8	-0.0350	0.0250	0.8620	0.0229	0.0180	0.0100	0.9250	0.0090
18	3	-0.0279	0.0051	0.9900	0.0004	0.0060	NS	0.3296	0.3115
	5.5	-0.0466	0.0063	0.9946	0.0002	0.0146	0.0089	0.9011	0.0136
	8	-0.0707	0.0177	0.9819	0.0010	0.0255	0.0043	0.9916	0.0003
19	3	-0.0603	0.0095	0.9927	0.0003	0.0174	0.0073	0.9583	0.0037
	5.5	-0.0761	0.0269	0.9643	0.0029	0.0279	0.0199	0.8690	0.0210
	8	-0.0104	NS	0.0108	0.1833	0.0205	NS	0.0040	0.4196
20	3	-0.0150	NS	0.0117	0.1604	0.0016	0.0013	0.8252	0.0328
	5.5	-0.0045	NS	0.2480	0.3933	Variance of zero			
	8	Variance of zero				Variance of zero			
21	3	0.0025	NS	0.3697	0.2766	0.0021	NS	0.5377	0.1586
	5.5	-0.0030	NS	0.4523	0.2135	-0.0048	NS	0.4167	0.2395
	8	-0.0156	0.0132	0.8262	0.0325	0.0015	NS	0.7167	0.0705
22	3	-0.0029	NS	0.7180	0.0699	0.0021	NS	0.2044	0.4447
	5.5	-0.0097	0.0017	0.9916	0.0003	0.0036	NS	0.6640	0.0929
	8	-0.0078	NS	0.3136	0.3263	0.0015	0.0014	0.8251	0.0328
23	3	-0.0149	0.0065	0.9460	0.0054	0.0030	NS	0.3102	0.3294
	5.5	-0.0098	NS	0.5674	0.1415	0.0016	0.0013	0.8252	0.0328
	8	-0.0144	NS	0.7114	0.0726	0.0014	NS	0.7114	0.0726
24	3	-0.0066	NS	0.2813	0.3578	0.0050	0.0049	0.7761	0.0484
	5.5	-0.0109	NS	0.4148	0.2409	-0.0023	NS	0.0744	0.6570
	8	-0.0306	0.0278	0.8033	0.0395	0.0148	NS	0.7683	0.0511
25	3	-0.0015	NS	0.1184	0.5708	0.0026	NS	0.3932	0.2575
	5.5	-0.0056	NS	0.3453	0.2975	0.0006	NS	0.0758	0.6539
	8	-0.0147	NS	0.7162	0.0706	0.0016	0.0013	0.8295	0.0316
26	3	-0.0031	0.0026	0.8286	0.0318	0.0008	NS	0.3087	0.3309
	5.5	-0.0047	0.0039	0.8286	0.0318	0.0005	NS	0.1271	0.5560
	8	-0.0146	NS	0.7190	0.0695	0.0009	NS	0.1013	0.6017
27	3	-0.0009	NS	0.0072	0.8924	-0.0044	NS	0.3446	0.2980
	5.5	-0.0622	0.0383	0.8988	0.0141	0.0177	0.0176	0.7740	0.0491
	8	-0.0691	0.0390	0.9140	0.0110	0.0236	0.0146	0.8982	0.0142
28	3	0.0086	NS	0.0965	0.6110	-0.0166	NS	0.6665	0.0918
	5.5	-0.0204	0.0182	0.8098	0.0375	0.0029	NS	0.1322	0.5475
	8	-0.0718	0.0142	0.9890	0.0005	0.0208	0.0190	0.8026	0.0397
29	3	-0.0592	0.0170	0.9590	0.0006	0.0062	NS	0.3301	0.2330
	5.5	-0.1844	0.0918	0.8861	0.0051	0.0610	0.4450	0.7842	0.0189
	8	-0.2218	0.0818	0.9341	0.0017	0.1224	0.0794	0.8207	0.0129
30	3	Variance of zero				-0.0005	NS	0.0301	0.7800
	5.5	-0.0006	NS	0.0265	0.7936	4.70E-03	NS	0.5890	0.1298
	8	Variance of zero				-0.0011	NS	0.1346	0.5436
31	3	-0.0201	NS	0.1282	0.5540	0.0106	NS	0.1622	0.5015
	5.5	-0.0302	NS	0.1282	0.5540	0.0151	NS	0.1282	0.5540

Respiration		Mean O <sub>2</sub>				Mean CO <sub>2</sub>			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(%/hr)	95% CI	r <sup>2</sup>	p Value	rate (%/hr)	95% CI	r <sup>2</sup>	p Value
	8	-0.0352	NS	0.1282	0.5540	0.0157	NS	0.1597	0.5051
32	3	No data				No data			
	5.5	0.0333	0.0098	0.9382	0.0003	-0.0110	NS	0.1507	0.3895
	8	-1.3807	NS	0.6169	0.2146	0.7274	NS	0.5663	0.2474
33	3	0.0042	NS	0.0912	0.5608	0.0092	NS	0.4888	0.1221
	5.5	0.0022	NS	0.0133	0.8276	0.0151	0.0130	0.7214	0.0323
	8	-0.0095	NS	0.0203	0.7875	0.0153	NS	0.0639	0.6289
34	3	-0.0439	0.0243	0.9167	0.0105	0.0187	0.0119	0.8921	0.0156
	5.5	-0.0778	0.0591	0.9603	0.0034	0.0261	0.0163	0.8967	0.0145
	8	-0.0867	0.0289	0.9681	0.0024	0.0287	0.0178	0.8974	0.0144
NOTE: NS = NOT SIGNIFICANT									



Respiration Monitoring	Depth	Mean O2 Uptake Rate				Mean CO2 Production			
Point	(ft)	(1/hr)	95% CI	r <sup>2</sup>	p Value	rate (1/hr)	95% CI	r <sup>2</sup>	p Value
1	3	0.0020	0.0010	0.950	0.0049	0.0000	NS	0.0001	0.9898
	5.5	0.0020	0.0010	0.862	0.0229	-0.0030	NS	0.0380	0.7545
	8	0.0030	NS	0.729	0.0654	0.0002	NS	0.0080	0.8843
2	3	0.0010	NS	0.261	0.3787	-0.0030	NS	0.2090	0.4385
	5.5	0.0001	NS	0.357	0.2872	0.0005	NS	0.1020	0.6005
	8	0.0020	NS	0.601	0.1233	0.0040	NS	0.7680	0.0511
3	3	-0.0020	0.0005	0.987	0.0006	0.0050	0.0030	0.9180	0.0101
	5.5	-0.0014	0.0010	0.844	0.0276	0.0035	0.0043	0.6953	0.0792
	8	-0.0110	0.0002	0.980	0.0012	0.0023	NS	0.6074	0.1202
4	3	-0.0031	0.0006	0.990	0.0004	0.0069	NS	0.6445	0.1019
	5.5	-0.0049	0.0009	0.989	0.0005	0.0058	0.0033	0.9128	0.0112
	8	-0.0072	0.0007	0.998	0.0001	0.0090	0.0027	0.9786	0.0013
5	3	-0.0023	NS	0.135	0.4730	0.0100	NS	0.2805	0.2798
	5.5	-0.0035	NS	0.078	0.5930	0.0070	NS	0.3781	0.1939
	8	-0.0066	NS	0.097	0.5473	0.0060	NS	0.5165	0.1076
6	3	-0.0019	0.0002	0.996	0.0001	0.0049	0.0020	0.9483	0.0051
	5.5	-0.0029	0.0011	0.959	0.0036	0.0106	0.0110	0.7370	0.0625
	8	-0.0036	0.0020	0.925	0.0090	0.0066	0.0027	0.9525	0.0045
7	3	-0.0007	NS	0.747	0.0589	0.0034	NS	0.7414	0.0609
	5.5	-0.0006	0.0003	0.973	0.0138	0.0067	0.0030	0.9784	0.0109
	8	-0.0008	0.0004	0.927	0.0085	0.0068	0.0020	0.9770	0.0015
8	3	0.0002	NS	0.137	0.5394	-0.0003	NS	0.0050	0.9110
	5.5	-0.0003	NS	0.696	0.0792	0.0021	NS	0.9770	0.0872
	8	-0.0009	0.0008	0.830	0.0315	0.0031	0.0007	0.9834	0.0009
9	3	-0.0010	0.0000	0.958	0.0037	0.0080	0.0050	0.8800	0.0182
	5.5	-0.0010	0.0000	0.998	0.0012	0.0050	0.0010	0.9960	0.0022
	8	-0.0010	0.0000	0.994	0.0029	0.0060	0.0030	0.9720	0.0139
10	3	0.0010	NS	0.471	0.2007	0.0010	0.0006	0.8830	0.0177
	5.5	-0.0001	NS	0.069	0.6685	0.0010	NS	0.5010	0.0181
	8	-0.0030	0.0030	0.800	0.0405	0.0050	0.0020	0.9160	0.0106
11	3	-0.0010	0.0005	0.931	0.0018	0.0000	NS	0.0003	0.9727
	5.5	-0.0060	0.0050	0.642	0.0554	0.0110	0.0050	0.4380	0.1519
	8	-0.0590	0.0029	0.935	0.0072	0.0130	0.0050	0.9520	0.0045
12	3	-0.0010	0.0005	0.986	0.0007	0.0020	NS	0.6630	0.0935
	5.5	-0.0010	0.0004	0.866	0.0217	0.0020	NS	0.6010	0.1238
	8	-0.0010	0.0005	0.954	0.0042	0.0050	0.0030	0.8740	0.0197
13	3	-0.0020	0.0005	0.992	0.0003	0.0020	NS	0.6520	0.0987
	5.5	-0.0030	0.0010	0.986	0.0007	0.0040	0.0020	0.9430	0.0059
	8	-0.0030	0.0005	0.998	0.0001	0.0080	0.0040	0.9370	0.0068
14	3	-0.0010	0.0005	0.877	0.0190	0.0010	NS	0.3040	0.3356
	5.5	-0.0010	0.0005	0.831	0.0311	0.0040	0.0040	0.8070	0.0383
	8	-0.0020	0.0005	0.971	0.0148	0.0060	0.0060	0.9110	0.0453
15	3	-0.0001	NS	0.223	0.4220	0.0004	NS	0.0190	0.8241
	5.5	-0.0002	NS	0.542	0.1561	0.0020	NS	0.1970	0.4539
	8	-0.0004	NS	0.752	0.0569	0.0040	NS	0.7490	0.0581
16	3	-0.0010	0.0002	0.802	0.0399	0.0100	NS	0.5780	0.1359

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (1/hr)	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production rate (1/hr)	95% CI	r <sup>2</sup>	p Value
	5.5	-0.0010	0.0002	0.860	0.0232	0.0050	0.0010	0.9810	0.0011
	8	-0.0010	0.0003	0.925	0.0089	0.0050	0.0020	0.9250	0.0890
17	3	-0.0010	NS	0.655	0.0972	0.0130	NS	0.5040	0.1788
	5.5	-0.0010	0.0010	0.856	0.0242	0.0070	0.0050	0.8820	0.0179
	8	-0.0020	0.0010	0.848	0.0264	0.0150	0.0100	0.8860	0.0169
18	3	-0.0018	0.0003	0.993	0.0003	0.0012	0.0006	0.3427	0.2997
	5.5	-0.0031	0.0003	0.997	0.0001	0.0029	0.0020	0.8688	0.0210
	8	-0.0043	0.0010	0.984	0.0009	0.0065	0.0017	0.9803	0.0012
19	3	-0.0036	0.0004	0.997	0.0001	0.0060	0.0031	0.9264	0.0087
	5.5	-0.0045	0.0016	0.964	0.0029	0.0114	0.0112	0.7799	0.0471
	8	-0.0038	NS	0.006	0.3306	0.0043	NS	0.0099	0.2042
20	3	-0.0002	NS	0.007	0.2729	0.0022	0.0018	0.8252	0.0328
	5.5	-0.0002	NS	0.235	0.4078	Variance of zero			
	8	-0.0001	NS	0.228	0.4158	0.0000	NS	0.1260	0.5577
21	3	0.0001	NS	0.320	0.3205	0.0023	NS	0.5377	0.1586
	5.5	-0.0001	NS	0.311	0.3283	-0.0099	NS	0.4853	0.1912
	8	-0.0002	0.0001	0.826	0.0325	0.0022	NS	0.7167	0.0705
22	3	-0.0001	NS	0.718	0.0699	0.0013	NS	0.2147	0.4318
	5.5	-0.0006	0.0002	0.981	0.0011	0.0039	NS	0.6779	0.0867
	8	-0.0004	NS	0.638	0.1049	0.0022	0.0002	0.8251	0.0328
23	3	-0.0009	0.0003	0.964	0.0029	0.0030	NS	0.3524	0.2913
	5.5	-0.0004	NS	0.461	0.2077	0.0022	0.0018	0.8252	0.0328
	8	-0.0009	0.0005	0.923	0.0093	0.0022	NS	0.7114	0.0726
24	3	-0.0004	NS	0.297	0.3426	0.0021	0.0018	0.8258	0.0326
	5.5	-0.0006	NS	0.452	0.2136	-0.0014	NS	0.1059	0.5932
	8	-0.0015	0.0006	0.958	0.0037	0.0092	NS	0.7310	0.0648
25	3	-3.9287E-5	NS	0.051	0.7141	0.0019	NS	0.4365	0.2248
	5.5	-0.0002	NS	0.345	0.2975	0.0007	NS	0.0641	0.6811
	8	-0.0003	NS	0.716	0.0706	0.0024	0.0019	0.8295	0.0316
26	3	-0.0002	0.0001	0.829	0.0318	0.0011	NS	0.3087	0.3309
	5.5	-0.0002	0.0001	0.829	0.0318	0.0007	NS	0.1271	0.5560
	8	-0.0005	0.0005	0.787	0.0448	0.0013	NS	0.0996	0.6050
27	3	-0.0001	NS	0.026	0.7948	-0.0011	NS	0.3873	0.2623
	5.5	-0.0041	0.0023	0.917	0.0104	0.0045	NS	0.7491	0.0580
	8	-0.0045	0.0017	0.958	0.0037	0.0088	0.0058	0.8855	0.0170
28	3	0.0008	NS	0.071	0.6645	-0.0021	NS	0.6430	0.1027
	5.5	-0.0029	0.0026	0.814	0.0363	0.0003	NS	0.1322	0.5475
	8	-0.0100	0.0028	0.978	0.0014	0.0027	0.0024	0.8019	0.0399
29	3	-0.0038	0.0010	0.965	0.0005	0.0019	NS	0.3341	0.2295
	5.5	-0.0190	0.0056	0.957	0.0007	0.0147	0.0171	0.5840	0.0768
	8	-0.0311	0.0063	0.979	0.0002	0.0176	0.0156	0.7090	0.0355
30	3	Variance of zero				-0.0005	NS	0.0301	0.7800
	5.5	-0.0001	NS	0.089	0.6254	5.20E-03	NS	0.6140	0.1168
	8	0.0001	NS	0.064	0.6822	-0.0009	NS	0.1467	0.5246
31	3	-0.0011	NS	0.128	0.5540	0.0073	NS	0.1893	0.4641
	5.5	-0.0018	NS	0.128	0.5540	0.0078	NS	0.1282	0.5540

Respiration		Mean O2				Mean CO2			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(1/hr)	95% CI	r <sup>2</sup>	p Value	rate (1/hr)	95% CI	r <sup>2</sup>	p Value
	8	-0.0023	NS	0.128	0.5540	0.0068	NS	0.1889	0.4646
32	3	No data				No data			
	5.5	0.0060	0.0022	0.905	0.0010	-0.0008	NS	0.1226	0.4413
	8	-0.8501	NS	0.912	0.1923	0.0816	NS	0.5466	0.2607
33	3	0.0003	NS	0.079	0.5901	0.0017	NS	0.4415	0.1500
	5.5	0.0002	NS	0.020	0.7889	0.0021	0.0018	0.7112	0.0349
	8	-0.0072	NS	0.248	0.6680	0.0015	NS	0.0775	0.5931
34	3	-0.0024	0.0014	0.914	0.0111	0.0086	0.0066	0.8496	0.0260
	5.5	-0.0048	0.0014	0.975	0.0017	0.0090	0.0066	0.8615	0.0229
	8	-0.0063	0.0019	0.974	0.0018	0.0090	0.0070	0.8477	
NOTE: NS = NOT SIGNIFICANT									

Respiration  Monitoring	Depth	Mean O2 Uptake Rate				Mean CO2 Production			
Point	(ft)	(%/hr)	95% CI	r^2	p Value	rate (%/hr)	95% CI	r^2	p Value
1	3	0.0088	NS	0.5752	0.0805	0.0007	NS	0.0376	0.7126
	5.5	0.0005	NS	0.0035	0.9111	0.0072	NS	0.6554	0.0509
	8	0.0138	NS	0.5969	0.0717	0.0156	0.0061	0.9279	0.0020
2	3	0.0010	NS	0.0383	0.7101	-0.0090	0.0040	0.9074	0.0033
	5.5	-0.0047	0.0041	0.7149	0.0339	0.0196	0.0107	0.8664	0.0070
	8	-0.1187	0.0030	0.9291	0.0019	0.6043	0.0021	0.6793	0.0436
3	3	-0.0157	0.0028	0.9626	0.0005	0.0040	NS	0.6021	0.0697
	5.5	-0.0170	0.0048	0.9608	0.0006	0.0043	0.0034	0.7599	0.0236
	8	-0.0110	0.0016	0.9896	0.0001	0.0030	NS	0.5439	0.0943
4	3	-0.0292	0.0066	0.9739	0.0003	0.0064	0.0055	0.7229	0.0320
	5.5	-0.0418	0.0052	0.9921	0.0001	0.0106	0.0032	0.9569	0.0007
	8	-0.0550	0.0153	0.9447	0.0002	0.0216	0.0083	0.9014	0.0011
5	3	-0.0142	0.0112	0.7578	0.0241	-0.0008	NS	0.0913	0.5605
	5.5	-0.0278	0.0138	0.8875	0.0049	0.0023	0.0021	0.7018	0.0374
	8	-0.0453	0.0185	0.9206	0.0024	0.0150	0.0110	0.7821	0.0193
6	3	-0.0253	0.0050	0.9887	0.0005	0.0030	0.0014	0.9376	0.0067
	5.5	-0.0286	0.0057	0.9887	0.0005	0.0064	0.0042	0.8880	0.0165
	8	-0.0311	0.0063	0.9878	0.0006	0.0081	0.0059	0.8658	0.0218
7	3	-0.0099	0.0048	0.9346	0.0072	-0.0009	NS	0.1475	0.5233
	5.5	-0.0098	0.0055	0.9154	0.0107	0.0004	NS	0.0381	0.7532
	8								
8	3	-0.0047	0.0024	0.9277	0.0084	-0.0012	NS	0.4175	0.2388
	5.5	-0.0089	0.0045	0.9309	0.0079	0.0004	NS	0.0123	0.8593
	8	-0.0088	NS	0.7428	0.0603	0.0012	NS	0.1645	0.4982
9	3	-0.0072	0.0035	0.9346	0.0072	-0.0005	NS	0.1405	0.5342
	5.5	-0.0115	0.0017	0.9939	0.0002	0.0000	NS	0.0000	0.9944
	8	-0.0114	0.0055	0.9369	0.0069	-0.0004	NS	0.0223	0.8105
10	3	-0.0184	0.0040	0.9864	0.0007	0.0004	NS	0.0287	0.7855
	5.5	-0.0262	0.0074	0.9771	0.0015	0.0068	NS	0.3074	0.3321
	8								
11	3	-0.0253	0.0326	0.3248	0.1091	0.0028	0.0025	0.4942	0.0346
	5.5	-0.0670	0.0140	0.9583	0.0001	0.0085	0.0029	0.9022	0.0003
	8	-0.1243	0.0457	0.8555	0.0004	0.0337	0.0039	0.9839	0.0001
12	3	-0.0116	0.0016	0.9947	0.0002	-0.0004	NS	0.1193	0.5691
	5.5	-0.0124	0.0057	0.9430	0.0059	-0.0004	NS	0.0794	0.6460
	8	-0.0167	NS	0.5635	0.1438	0.0000	NS	0.0000	0.9920
13	3	-0.0151	0.0069	0.9414	0.0061	0.0009	NS	0.0769	0.6514
	5.5	-0.0168	0.0071	0.9503	0.0048	0.0017	NS	0.2301	0.4136
	8	-0.0207	0.0082	0.9557	0.0040	-0.0009	NS	0.0810	0.6426
14	3	-0.0065	0.0048	0.8636	0.0223	-0.0035	NS	0.6593	0.0951
	5.5	-0.0032	NS	0.2346	0.4084	-0.0009	NS	0.1399	0.5351
	8	-0.0176	0.0110	0.8966	0.0146	0.0034	NS	0.6745	0.0882
15	3	-0.0043	NS	0.5323	0.2704	-0.0031	NS	0.8196	0.0947
	5.5	-0.0052	NS	0.6499	0.0994	-0.0031	NS	0.7263	0.6770
	8								
16	3	-0.0078	0.0032	0.9527	0.0044	-0.0022	NS	0.6352	0.1064

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (%/hr)	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production rate (%/hr)	95% CI	r <sup>2</sup>	p Value
	5.5	-0.0057	NS	0.7481	0.0584	-0.0026	NS	0.5128	0.1736
	8	-0.0074	0.0055	0.8606	0.0231	-0.0005	NS	0.1382	0.5379
17	3	-0.0061	0.0034	0.9153	0.0107	-0.0026	NS	0.5320	0.1619
	5.5	-0.0100	0.0034	0.9663	0.0027	-0.0004	NS	0.0871	0.6297
	8	-0.0157	0.0055	0.9657	0.0027	0.0009	NS	0.4894	0.1885
18	3	-0.0065	0.0066	0.7717	0.0499	-0.0065	0.0064	0.7789	0.0474
	5.5	-0.0122	NS	0.6583	0.0955	-0.0017	NS	0.1253	0.5590
	8	-0.0174	NS	0.7644	0.0525	0.0017	NS	0.2292	0.4146
19	3	-0.0161	0.0133	0.8318	0.0309	-0.0004	NS	0.0870	0.6300
	5.5	-0.0210	NS	0.8630	0.2414	0.0015	NS	0.5221	0.4859
	8	-0.0293	0.0211	0.8664	0.0216	0.0026	NS	0.6754	0.0878
20	3	-0.0026	0.0016	0.9087	0.0120	-0.0027	0.0027	0.7738	0.0492
	5.5	-0.0026	NS	0.4827	0.1929	-0.0035	0.0034	0.7858	0.0451
	8	-0.0078	0.0078	0.9171	0.0104	-0.0035	0.0021	0.9021	0.0134
21	3	-0.0021	NS	0.1056	0.5937	-0.0035	0.0034	0.7864	0.0449
	5.5	-0.0047	NS	0.6463	0.1011	-0.0026	0.0016	0.9091	0.0120
	8	-0.0047	0.0044	0.7955	0.0420	-0.0031	NS	0.6831	0.0845
22	3	-0.0040	NS	0.7515	0.1430	-0.0004	NS	0.0810	0.6426
	5.5	-0.0083	0.0025	0.9750	0.0017	-0.0005	NS	0.1377	0.5385
	8	-0.0083	0.0059	0.8684	0.0211	0.0008	NS	0.1093	0.5869
23	3	-0.0071	NS	0.3963	0.2551	-0.0018	NS	0.5815	0.1339
	5.5	-0.0096	0.0082	0.8237	0.0333	-0.0018	NS	0.5815	0.1339
	8	-0.0088	NS	0.7337	0.0638	-0.0013	NS	0.7422	0.0606
24	3	-0.0083	0.0067	0.8416	0.0284	-0.0009	NS	0.1258	0.5580
	5.5	-0.0158	0.0092	0.9080	0.0122	-0.0017	0.0017	0.7929	0.0428
	8	-0.0096	NS	0.7022	0.0763	-0.0013	NS	0.7538	0.0563
25	3	-0.0026	NS	0.7319	0.0645	-0.0023	NS	0.4431	0.2272
	5.5	-0.0022	NS	0.2578	0.3825	-0.0031	NS	0.6088	0.1195
	8	-0.0043	NS	0.3436	0.2990	-0.0031	NS	0.7015	0.0766
26	3	-0.0160	NS	0.9879	0.0701	-0.0001	NS	0.0008	0.9823
	5.5	-0.0095	NS	0.5687	0.1408	-0.0027	NS	0.3487	0.2944
	8	-0.0083	NS	0.6193	0.1142	-0.0014	NS	0.1962	0.4550
27	3	-0.0163	0.0055	0.9697	0.0025	-0.0049	NS	0.6874	0.0826
	5.5	-0.0234	0.0091	0.9574	0.0038	0.0005	NS	0.0410	0.7440
	8	-0.0182	0.0117	0.8915	0.0157	0.0035	NS	0.7319	0.0645
28	3	-0.0386	0.0223	0.7498	0.0054	0.0122	NS	0.3739	0.1072
	5.5	-0.0222	0.0104	0.8214	0.0019	-0.0017	NS	0.0453	0.6128
	8								
29	3	-0.0158	NS	0.6747	0.1786	0.0020	NS	0.7191	0.1520
	5.5	-0.0312	0.0210	0.6896	0.0107	0.0032	0.0017	0.7901	0.0031
	8	-0.0570	0.0331	0.7473	0.0056	0.0258	0.0101	0.8671	0.0008
30	3	0.0009	NS	0.1336	0.5452	-0.0039	NS	0.7298	0.0653
	5.5	-0.0003	NS	0.0111	0.8659	-0.0035	NS	0.7298	0.0653
	8	0.0014	NS	0.1498	0.5199	-0.0035	NS	0.4983	0.1828
31	3	-0.0184	NS	0.1348	0.5432	0.0096	NS	0.1663	0.4955
	5.5	0.0006	NS	0.0178	0.8307	-0.0032	NS	0.5673	0.1416

Respiration		Mean O <sub>2</sub>				Mean CO <sub>2</sub>			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(%/hr)	95% CI	r <sup>2</sup>	p Value	rate (%/hr)	95% CI	r <sup>2</sup>	p Value
	8	0.0023	NS	0.2042	0.4449	-0.0040	0.0041	0.8292	0.0317
32	3								
	5.5	0.0195	0.0179	0.4425	0.0358	0.0076	NS	0.1147	0.3385
	8								
33	3	-0.0330	0.0166	0.7981	0.0028	0.0068	NS	0.4397	0.0731
	5.5	-0.0072	NS	0.3745	0.1966	0.0011	NS	0.0061	0.8826
	8								
34	3	-0.0556	0.0426	0.8517	0.0254	0.0119	NS	0.5038	0.1793
	5.5	-0.0422	0.0062	0.9791	0.0001	0.0050	NS	0.7440	0.0558
	8	-0.0639	0.0130	0.9601	0.0001	0.0150	0.0043	0.9259	0.0001
NS = NOT SIGNIFICANT									

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (1/hr)	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production rate (1/hr)	95% CI	r <sup>2</sup>	p Value
1	3	0.0006	NS	0.5801	0.0785	0.0001	NS	0.0386	0.7093
	5.5	0.0000	NS	0.0044	0.9008	0.0011	NS	0.6561	0.0507
	8	-0.0010	NS	0.6115	0.0661	0.0023	0.0009	0.9247	0.0022
2	3	0.0001	NS	0.0396	0.7053	-0.0040	0.0018	0.9093	0.0032
	5.5	-0.0002	0.0003	0.7124	0.0346	0.0055	0.0029	0.8757	0.0061
	8	-0.0131	0.0002	0.9307	0.0018	0.0253	0.0006	0.6776	0.0441
3	3	-0.0008	0.0002	0.9659	0.0004	0.0028	NS	0.6005	0.0703
	5.5	-0.0009	0.0003	0.9642	0.0005	0.0025	0.0020	0.7510	0.0255
	8	-0.0006	0.0001	0.9906	0.0001	0.0014	NS	0.5486	0.0922
4	3	-0.0016	0.0004	0.9756	0.0002	0.0032	0.0029	0.7099	0.0352
	5.5	-0.0025	0.0003	0.9951	0.0001	0.0038	0.0013	0.9452	0.0011
	8	-0.0036	0.0008	0.9633	0.0001	0.0063	0.0031	0.8453	0.0034
5	3	-0.0009	0.0007	0.7543	0.0248	-0.0002	NS	0.0887	0.5664
	5.5	-0.0018	0.0010	0.8784	0.0058	0.0006	0.0006	0.6933	0.0397
	8	-0.0036	0.0017	0.9016	0.0038	0.0028	0.0020	0.8059	0.0152
6	3	-0.0014	0.0003	0.9857	0.0007	0.0016	0.0008	0.9313	0.0078
	5.5	-0.0016	0.0004	0.9870	0.0006	0.0033	0.0023	0.8745	0.0196
	8	-0.0017	0.0003	0.9918	0.0003	0.0035	0.0024	0.8763	0.0192
7	3	-0.0005	0.0003	0.9329	0.0075	-0.0009	NS	0.1486	0.5216
	5.5	-0.0005	0.0003	0.9181	0.0102	0.0005	NS	0.0539	0.7071
	8								
8	3	-0.0002	0.0002	0.9274	0.0085	-0.0009	NS	0.4071	0.2467
	5.5	-0.0005	0.0003	0.9326	0.0076	0.0003	NS	0.0160	0.8392
	8	-0.0004	NS	0.7467	0.0589	0.0009	NS	0.1856	0.4689
9	3	-0.0004	0.0002	0.9358	0.0070	-0.0006	NS	0.1405	0.5342
	5.5	-0.0006	0.0001	0.9948	0.0002	0.0000	NS	0.0000	0.9944
	8	-0.0006	0.0003	0.9393	0.0065	-0.0008	NS	0.0128	0.8562
10	3	-0.0010	0.0002	0.9945	0.0005	0.0002	NS	0.0334	0.7685
	5.5	-0.0014	0.0005	0.9713	0.0021	0.0032	NS	0.3539	0.2899
	8								
11	3	-0.0015	NS	0.3517	0.0923	0.0011	0.0010	0.4890	0.0360
	5.5	-0.0045	0.0008	0.9750	0.0001	0.0027	0.0009	0.9051	0.0003
	8	-0.0190	0.0056	0.9011	0.0001	0.0070	0.0012	0.9647	0.0001
12	3	-0.0006	0.0001	0.9945	0.0002	-0.0006	NS	0.1193	0.5691
	5.5	-0.0006	0.0003	0.9426	0.0059	-0.0005	NS	0.0794	0.6460
	8	-0.0009	NS	0.5543	0.1489	-0.0006	NS	0.0059	0.9026
13	3	-0.0008	0.0004	0.9455	0.0055	0.0007	NS	0.0583	0.6956
	5.5	-0.0009	0.0004	0.9541	0.0042	0.0015	NS	0.2164	0.4299
	8	-0.0010	0.0004	0.9616	0.0032	-0.0015	NS	0.0646	0.6799
14	3	-0.0003	0.0003	0.8621	0.0227	-0.0024	NS	0.6684	0.0909
	5.5	-0.0002	NS	0.2356	0.4072	-0.0007	NS	0.1386	0.5372
	8	-0.0009	0.0005	0.9053	0.0131	0.0035	NS	0.6577	0.0958
15	3	-0.0002	NS	0.5323	0.2704	-0.0047	NS	0.7827	0.1153
	5.5	-0.0003	NS	0.6484	0.1001	-0.0048	NS	0.7010	0.0769
	8								
16	3	-0.0004	0.0002	0.9514	0.0046	-0.0031	NS	0.6164	0.1156

Respiration	Mean O2					Mean CO2			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(1/hr)	95% CI	r <sup>2</sup>	p Value	rate (1/hr)	95% CI	r <sup>2</sup>	p Value
	5.5	-0.0003	NS	0.7454	0.0594	-0.0045	NS	0.4444	0.2192
	8	-0.0004	0.0003	0.8623	0.0227	-0.0010	NS	0.1382	0.5379
17	3	-0.0003	0.0002	0.9168	0.0105	-0.0028	NS	0.5582	0.1467
	5.5	-0.0005	0.0002	0.9682	0.0024	-0.0006	NS	0.0871	0.6297
	8	-0.0008	0.0003	0.9675	0.0025	0.0019	NS	0.4894	0.1885
18	3	-0.0003	NS	0.7686	0.0510	-0.0032	NS	0.7688	0.0509
	5.5	-0.0006	NS	0.6547	0.0972	-0.0009	NS	0.1396	0.5355
	8	-0.0009	NS	0.7687	0.0510	0.0012	NS	0.2459	0.3955
19	3	-0.0008	0.0007	0.8338	0.0303	-0.0005	NS	0.2949	0.6300
	5.5	-0.0011	NS	0.8584	0.2456	0.0017	NS	0.5542	0.4654
	8	-0.0015	0.0011	0.8687	0.0210	0.0040	NS	0.6663	0.0919
20	3	-0.0001	0.0001	0.9087	0.0120	-0.0045	0.0045	0.7738	0.0492
	5.5	-0.0001	NS	0.4827	0.1929	-0.0077	0.0076	0.7803	0.0470
	8	-0.0004	0.0002	0.9162	0.0106	-0.0103	0.0061	0.9074	0.0123
21	3	-0.0001	NS	0.1040	0.5965	-0.0073	NS	0.7642	0.0526
	5.5	-0.0002	NS	0.6474	0.1006	-0.0067	0.0040	0.9507	0.0131
	8	-0.0002	0.0002	0.7951	0.0421	-0.0156	NS	0.7245	0.0674
22	3	-0.0002	NS	0.5632	0.1439	-0.0006	NS	0.0810	0.6426
	5.5	-0.0004	0.0001	0.9757	0.0016	-0.0008	NS	0.1377	0.5385
	8	-0.0004	0.0003	0.8673	0.0214	0.0023	NS	0.0759	0.6537
23	3	-0.0003	NS	0.3929	0.2578	-0.0031	NS	0.7827	0.1176
	5.5	-0.0005	0.0004	0.8228	0.0335	-0.0048	NS	0.6271	0.1103
	8	-0.0004	NS	0.7307	0.0650	-0.0037	NS	0.7422	0.0606
24	3	-0.0004	0.0004	0.8392	0.0288	-0.0010	NS	0.1258	0.5580
	5.5	-0.0008	0.0005	0.9064	0.0125	-0.0019	0.0019	0.7920	0.0431
	8	-0.0005	NS	0.8347	0.0787	-0.0018	NS	0.7538	0.0563
25	3	-0.0001	NS	0.7308	0.0649	-0.0023	NS	0.3981	0.2537
	5.5	-0.0001	NS	0.2598	0.3803	-0.0054	NS	0.5698	0.1402
	8	-0.0002	NS	0.3451	0.2976	-0.0087	NS	0.6357	0.1062
26	3	-0.0008	NS	0.9868	0.0733	-0.0001	NS	0.0008	0.9823
	5.5	-0.0005	NS	0.5666	0.1420	-0.0066	NS	0.2671	0.3726
	8	-0.0004	NS	0.6177	0.1150	-0.0042	NS	0.1822	0.4735
27	3	-0.0008	0.0003	0.9655	0.0028	-0.0035	NS	0.6461	0.1012
	5.5	-0.0012	0.0005	0.9581	0.0037	0.0004	NS	0.0433	0.7370
	8	-0.0009	0.0006	0.8956	0.0148	0.0052	NS	0.7220	0.0684
28	3	-0.0025	0.0014	0.7692	0.0042	0.0038	NS	0.3634	0.1137
	5.5	-0.0015	0.0007	0.8330	0.0016	-0.0005	NS	0.0501	0.5942
	8								
29	3	-0.0009	NS	0.6713	0.1807	0.0015	NS	0.7191	0.1520
	5.5	-0.0018	0.0012	0.6890	0.0108	0.0016	0.0008	0.7882	0.0032
	8	-0.0033	0.0019	0.7569	0.0050	0.0159	0.0094	0.7424	0.0060
30	3	0.0000	NS	0.1336	0.5452	-0.0047	NS	0.7298	0.0653
	5.5	0.0000	NS	0.0115	0.8634	-0.0047	NS	0.7298	0.0653
	8	0.0001	NS	0.1498	0.5199	-0.0042	NS	0.6722	0.2138
31	3	-0.0010	NS	0.1348	0.5432	0.0066	NS	0.1952	0.4564
	5.5	0.0000	NS	0.0172	0.8334	-0.0057	NS	0.5167	0.1712



Respiration		Mean O <sub>2</sub>				Mean CO <sub>2</sub>			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(1/hr)	95% CI	r <sup>2</sup>	p Value	rate (1/hr)	95% CI	r <sup>2</sup>	p Value
	8	0.0001	NS	0.2042	0.4449	-0.0057	0.0057	0.7777	0.0478
32	3								
	5.5	0.0029	0.0028	0.4232	0.0417	0.0009	NS	0.1183	0.3304
	8								
33	3	-0.0020	0.0010	0.8123	0.0022	0.0022	NS	0.4189	0.0828
	5.5	-0.0005	NS	0.3788	0.1933	0.0001	NS	0.0014	0.9439
	8								
34	3	-0.0032	0.0026	0.8345	0.0301	0.0079	NS	0.4707	0.2009
	5.5	-0.0023	0.0003	0.9856	0.0001	0.0041	0.0026	0.7240	0.0074
	8	-0.0038	0.0010	0.9466	0.0001	0.0094	0.0025	0.9354	0.0001
NS = NOT SIGNIFICANT									

Respiration		Mean O2				Mean CO2			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(%/hr)	95% CI	r^2	p Value	rate (%/hr)	95% CI	r^2	p Value
1	3	0.0390	NS	0.5540	0.1489	-0.0300	NS	0.3950	0.2561
	5.5	0.0610	NS	0.4700	0.2011	-0.0460	NS	0.3590	0.2858
	8	0.0560	NS	0.5200	0.1690	-0.0280	NS	0.1530	0.5147
2	3	-0.0030	NS	0.0220	0.7798	-0.0040	NS	0.0320	0.7351
	5.5	-0.0300	NS	0.2310	0.3349	0.0140	NS	0.0530	0.6614
	8	-0.0380	NS	0.2640	0.2975	0.0150	NS	0.0480	0.6776
3	3	-0.0690	0.0310	0.9790	0.0107	0.0190	0.0110	0.9630	0.0184
	5.5	-0.0670	0.0210	0.9900	0.0050	0.0170	0.0080	0.9730	0.0134
	8	-0.0460	0.0085	0.9990	0.0003	0.0090	NS	0.6480	0.1953
4	3	-0.0896	0.0078	0.9925	0.0001	0.0329	0.0026	0.9936	0.0001
	5.5	-0.1147	0.0115	0.9900	0.0001	0.0343	0.0057	0.9733	0.0001
	8	-0.1387	0.0059	0.9764	0.0001	0.0427	0.0068	0.9749	0.0001
5	3	0.0047	NS	0.5129	0.0702	-0.0065	NS	0.4569	0.0955
	5.5	-0.0046	NS	0.1398	0.4087	0.0065	NS	0.2127	0.2975
	8	-0.0294	NS	0.4689	0.0896	0.0111	NS	0.1414	0.4057
6	3	-0.0225	0.0026	0.9958	0.0001	0.0077	NS	0.5909	0.1288
	5.5	-0.0617	0.0260	0.9501	0.0048	0.0302	0.0190	0.8943	0.0151
	8	-0.0656	0.0169	0.9807	0.0011	0.0248	0.0085	0.9663	0.0027
7	3	-0.0130	NS	0.5470	0.2603	0.0040	NS	0.4620	0.3205
	5.5	-0.0270	NS	0.8580	0.0737	0.0150	0.0140	0.9110	0.0455
	8	-0.0260	NS	0.8260	0.0909	0.0080	0.0050	0.9630	0.0186
8	3	0.0114	0.0072	0.9586	0.0209	-0.0189	0.0133	0.9489	0.0259
	5.5	-0.0071	NS	0.1809	0.5747	0.0065	NS	0.3664	0.3947
	8	-0.0036	NS	0.3641	0.3966	0.0024	NS	0.1125	0.6647
9	3	-0.0091	NS	0.8295	0.0892	0.0046	NS	0.1939	0.5596
	5.5	-0.0156	0.0073	0.9768	0.0117	0.0114	NS	0.8933	0.0548
	8	-0.0218	0.0216	0.9043	0.0491	0.0042	NS	0.5939	0.2294
10	3	0.0050	NS	0.3830	0.1902	-0.0080	NS	0.3010	0.2595
	5.5	-0.0180	0.0140	0.7460	0.0266	0.0090	NS	0.3520	0.2146
	8	-0.0340	NS	0.5300	0.1011	0.0160	NS	0.4290	0.1580
11	3	0.0382	NS	0.3500	0.1618	-0.0312	NS	0.4336	0.1078
	5.5	-0.0430	0.0105	0.9568	0.0001	0.0189	0.0168	0.6251	0.0343
	8	-0.2159	0.0876	0.9215	0.0024	0.0714	0.0433	0.8397	0.0102
12	3	0.0047	NS	0.1244	0.5605	-0.0006	NS	0.0024	0.9381
	5.5	-0.0290	0.0102	0.9647	0.0028	0.0099	NS	0.7380	0.0621
	8	-0.0447	0.0097	0.9863	0.0007	0.0117	0.0071	0.9022	0.0134
13	3	-0.0536	0.0410	0.7676	0.0221	0.0205	0.0182	0.7088	0.0355
	5.5	-0.0810	0.0518	0.8248	0.0123	0.0354	0.0120	0.9437	0.0012
	8	-0.1012	0.0451	0.9065	0.0034	0.0153	0.0081	0.8728	0.0063
14	3	-0.0125	0.0066	0.9705	0.0149	-0.0029	NS	0.1414	0.6240
	5.5	-0.0283	NS	0.8439	0.0813	0.0076	0.0073	0.9100	0.0461
	8	-0.0399	0.0388	0.9074	0.0474	0.0141	0.0036	0.9928	0.0036
15	3	-0.0012	NS	0.2196	0.5313	-0.0008	NS	0.0272	0.8352

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (%/hr)	95% CI	r^2	p Value	Mean CO2 Production rate (%/hr)	95% CI	r^2	p Value
	5.5	-0.0099	NS	0.6845	0.1726	0.0043	NS	0.3706	0.3913
	8	-0.0157	NS	0.7794	0.1172	0.0096	NS	0.6316	0.2053
16	3	-0.0099	NS	0.7417	0.1388	0.0064	NS	0.5926	0.2302
	5.5	-0.0282	NS	0.8798	0.0620	0.0157	0.0042	0.9925	0.0037
	8	-0.0361	0.0338	0.9133	0.0443	0.0117	0.0102	0.9246	0.0385
17	3	-0.0391	0.0325	0.9310	0.0351	0.0165	0.0148	0.9189	0.0414
	5.5	-0.0499	NS	0.8760	0.0640	0.0241	NS	0.8910	0.0561
	8	-0.0541	0.0300	0.9677	0.0163	0.0250	0.0142	0.9663	0.0170
18	3	-0.0467	0.0229	0.8890	0.0048	0.0274	0.0111	0.9213	0.0024
	5.5	-0.0784	0.0071	0.6659	0.0477	0.0509	0.0135	0.9647	0.0005
	8	-0.1042	0.0452	0.9109	0.0031	0.0485	0.0091	0.9802	0.0001
19	3	-0.0651	0.0098	0.9878	0.0006	0.0180	0.0062	0.9659	0.0027
	5.5	-0.0772	0.0189	0.9825	0.0010	0.0318	0.0053	0.9919	0.0003
	8	-0.0814	0.0135	0.9920	0.0003	0.0254	0.0055	0.9867	0.0007
20	3	-0.0114	0.0059	0.9725	0.0138	-0.0008	NS	0.0193	0.8611
	5.5	-0.0019	NS	0.0744	0.7272	0.0052	NS	0.6822	0.1741
	8	-0.0049	NS	0.4250	0.3481	0.0045	NS	0.4052	0.3634
21	3	-0.0056	NS	0.5283	0.1642	0.0033	NS	0.4641	0.2054
	5.5	-0.0253	0.0134	0.9234	0.0092	0.0083	NS	0.6652	0.0924
	8	-0.0533	0.0310	0.9092	0.0119	0.0207	0.0071	0.9665	0.0026
22	3	0.0008	NS	0.0522	0.6634	-0.0114	NS	0.5211	0.1053
	5.5	-0.0035	NS	0.6281	0.0601	-0.0023	NS	0.0846	0.5760
	8	-0.0048	0.0030	0.8285	0.0117	0.0018	NS	0.0160	0.8114
23	3	-0.0039	NS	0.0749	0.7263	0.0002	NS	0.0006	0.9762
	5.5	-0.0736	0.0366	0.9317	0.0077	0.0080	0.0052	0.8902	0.0160
	8	-0.0571	0.0426	0.9358	0.0070	0.0195	NS	0.7676	0.0514
24	3	-0.0510	0.0222	0.9470	0.0053	0.0133	0.0124	0.7942	0.0424
	5.5	-0.0849	0.0438	0.9268	0.0086	0.0254	0.0119	0.9386	0.0066
	8	-0.1030	0.0302	0.9751	0.0017	0.0351	0.0136	0.9784	0.0038
25	3	0.0044	NS	0.0733	0.7293	0.0021	NS	0.0395	0.8013
	5.5	0.0060	NS	0.1102	0.6681	0.0021	NS	0.2345	0.5157
	8	0.0023	NS	0.0943	0.6930	0.0032	NS	0.5122	0.2843
26	3	0.0143	NS	0.1035	0.6782	0.0248	NS	0.3365	0.4199
	5.5	-0.0054	NS	0.2206	0.5303	0.0298	NS	0.7021	0.1621
	8	0.0093	NS	0.0238	0.8456	0.0007	NS	0.0011	0.9667
27	3	0.0550	0.0269	0.8069	0.0024	-0.0298	0.0076	0.9384	0.0001
	5.5	0.0590	0.0418	0.6655	0.0135	-0.0287	0.0286	0.5017	0.0493
	8	0.0237	0.0205	0.1082	0.4264	0.0004	NS	0.0000	0.9871
28*	3	0.1830	0.1600	0.5120	0.0301	-0.0460	NS	0.1860	0.2465
	5.5	-0.0430	NS	0.3290	0.1062	0.0840	0.0680	0.5470	0.0227
	8	-0.1690	0.0530	0.8890	0.0001	0.0940	0.0440	0.7820	0.0015
29*	3	-0.0750	NS	0.4640	0.0628	0.0430	NS	0.3550	0.1194
	5.5	-0.2110	0.0760	0.8860	0.0005	0.0750	0.0330	0.8390	0.0014

Respiration		Mean O2				Mean CO2			
Monitoring	Depth	Uptake Rate				Production			
Point	(ft)	(%/hr)	95% CI	r^2	p Value	rate (%/hr)	95% CI	r^2	p Value
	8	-0.3280	0.0430	0.9830	0.0001	0.1480	0.0510	0.8960	0.0004
30	3	0.0098	NS	0.2546	0.4954	-0.0016	NS	0.2693	0.4811
	5.5	0.0082	NS	0.4091	0.3604	-0.0013	NS	0.3795	0.3840
	8	0.0070	NS	0.2938	0.4580	-0.0026	NS	0.3357	0.4206
31	3	0.0070	NS	0.2570	0.2460	-0.0010	NS	0.0260	0.7273
	5.5	0.0030	NS	0.0580	0.6044	0.0010	NS	0.0610	0.5932
	8	0.0040	NS	0.0850	0.5266	0.0040	NS	0.2000	0.3147
32	3	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
	5.5	0.0280	0.0180	0.8240	0.0001	-0.0160	0.0300	0.3430	0.0353
	8	No Data	No Data	No Data	No Data	no data	no data	no data	no data
33*	3	-0.0560	NS	0.2130	0.2499	0.1010	NS	0.2570	0.1995
	5.5	0.0460	NS	0.0860	0.4813	0.0720	NS	0.2760	0.1812
	8	-6.1060	NS	0.4460	0.5346	1.2210	NS	0.4460	0.5346
34*	3	-0.0720	0.0230	0.8860	0.0002	0.0410	0.0170	0.8120	0.0009
	5.5	-0.1360	0.0260	0.9560	0.0001	0.0650	0.0370	0.7120	0.0042
	8	-0.1670	0.0300	0.9620	0.0001	0.0440	0.0300	0.6260	0.0111

NOTE: NS = NOT SIGNIFICANT; \* RATES BASED ON DATA BEFORE AIR INJECTION CONDUCTED

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (1/hr)	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production rate (1/hr)	95% CI	r <sup>2</sup>	p Value
1	3	0.0030	NS	0.5770	0.1361	-0.0060	NS	0.2780	0.3610
	5.5	0.0070	NS	0.5640	0.1434	-0.0050	NS	0.2670	0.3726
	8	0.0080	NS	0.6050	0.1214	-0.0030	NS	0.1270	0.5557
2	3	-0.0002	NS	0.0260	0.7608	-0.0010	NS	0.0560	0.6505
	5.5	-0.0020	NS	0.1760	0.4079	0.0020	NS	0.0770	0.5955
	8	-0.0030	NS	0.1860	0.3939	0.0020	NS	0.0650	0.6259
3	3	-0.0050	0.0010	0.9920	0.0039	0.0050	0.0040	0.9350	0.0331
	5.5	-0.0050	0.0005	0.9980	0.0012	0.0040	0.0025	0.9650	0.0176
	8	-0.0030	0.0000	0.9990	0.0004	0.0020	0.0025	0.6200	0.2123
4	3	-0.0082	0.0007	0.9913	0.0001	0.0059	0.0006	0.9918	0.0001
	5.5	-0.0118	0.0010	0.9922	0.0001	0.0066	0.0011	0.9729	0.0001
	8	-0.0158	0.0009	0.9967	0.0001	0.0105	0.0035	0.8990	0.0003
5	3	0.0002	NS	0.4330	0.1081	-0.0055	NS	0.4635	0.0923
	5.5	-0.0006	NS	0.1268	0.4330	0.0007	NS	0.2127	0.2975
	8	-0.0080	NS	0.5132	0.0701	0.0010	NS	0.1506	0.3897
6	3	-0.0013	0.0001	0.9958	0.0001	0.0026	NS	0.5850	0.1320
	5.5	-0.0043	0.0017	0.9554	0.0040	0.0084	0.0065	0.8481	0.0264
	8	-0.0048	0.0008	0.9928	0.0003	0.0060	0.0013	0.9853	0.0008
7	3	-0.0010	NS	0.5450	0.2620	0.0020	NS	0.4450	0.3331
	5.5	-0.0020	NS	0.8860	0.0589	0.0070	NS	0.8260	0.0912
	8	-0.0010	NS	0.8590	0.0731	0.0060	0.0060	0.9120	0.0452
8	3	0.0007	0.0004	0.9683	0.0160	-0.0031	0.0018	0.9655	0.0174
	5.5	-0.0005	NS	0.1582	0.6023	0.0011	NS	0.3911	0.3746
	8	-0.0002	NS	0.2801	0.4707	0.0004	NS	0.1453	0.6188
9	3	-0.0005	0.0004	0.9266	0.0374	0.0020	NS	0.1862	0.5685
	5.5	-0.0009	0.0003	0.9880	0.0060	0.0052	NS	0.8432	0.0817
	8	-0.0012	NS	0.8995	0.0516	0.0023	NS	0.5547	0.2552
10	3	0.0000	NS	0.3780	0.1937	-0.0010	NS	0.2960	0.2640
	5.5	-0.0010	0.0010	0.7490	0.0260	0.0020	NS	0.3310	0.2324
	8	-0.0020	NS	0.4800	0.1272	0.0030	NS	0.4430	0.1491
11	3	0.0027	NS	0.3426	0.1674	-0.0060	NS	0.4578	0.0951
	5.5	-0.0042	0.0009	0.9718	0.0001	0.0024	0.0022	0.6135	0.0372
	8	-0.0470	0.0029	0.9980	0.0001	0.0101	0.0067	0.8185	0.0132
12	3	0.0003	NS	0.1693	0.4912	0.0004	NS	0.0016	0.9490
	5.5	-0.0018	0.0006	0.9734	0.0019	0.0031	NS	0.6915	0.0809
	8	-0.0028	0.0006	0.9879	0.0006	0.0037	0.0027	0.8677	0.0213
13	3	-0.0062	0.0039	0.8282	0.0118	0.0020	0.0018	0.7051	0.0365
	5.5	-0.0099	0.0040	0.9201	0.0025	0.0041	0.0048	0.9078	0.0033
	8	-0.0083	0.0021	0.9670	0.0004	0.0059	0.0032	0.8664	0.0070
14	3	-0.0007	0.0005	0.9460	0.0274	-0.0007	NS	0.1538	0.6078
	5.5	-0.0017	NS	0.8676	0.0685	0.0017	0.0016	0.9100	0.0461
	8	-0.0024	0.0020	0.9243	0.0386	0.0045	0.0009	0.9962	0.0019
15	3	-0.0001	NS	0.2196	0.5313	-0.0004	NS	0.0194	0.8609
	5.5	-0.0005	NS	0.7151	0.1544	0.0016	NS	0.3383	0.4184
	8	-0.0009	NS	0.7830	0.1151	0.0057	NS	0.5185	0.2799
16	3	-0.0005	NS	0.8315	0.0882	0.0027	NS	0.5296	0.2723
	5.5	-0.0016	NS	0.8878	0.0578	0.0079	0.0051	0.9559	0.0223
	8	-0.0019	0.0015	0.9349	0.0331	0.0106	NS	0.8302	0.0888
17	3	-0.0027	0.0018	0.9529	0.0238	0.0031	NS	0.8948	0.0541
	5.5	-0.0031	0.0030	0.9075	0.0474	0.0062	NS	0.8124	0.0987
	8	-0.0033	0.0013	0.9837	0.0082	0.0104	NS	0.8802	0.0618
18	3	-0.0047	0.0020	0.9070	0.0033	0.0032	0.0014	0.9081	0.0033
	5.5	-0.0080	0.0072	0.7014	0.0375	0.0065	0.0024	0.9333	0.0017

Respiration Monitoring Point	Depth (ft)	Mean O2 Uptake Rate (1/hr)	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production rate (1/hr)	95% CI	r <sup>2</sup>	p Value
19	8	-0.0092	0.0030	0.9494	0.0010	0.0110	0.0043	0.9254	0.0021
	3	-0.0046	0.0006	0.9945	0.0002	0.0043	0.0010	0.9842	0.0090
	5.5	-0.0054	0.0009	0.9920	0.0003	0.0103	0.0042	0.9530	0.0044
	8	-0.0052	0.0008	0.9944	0.0002	0.0146	0.0030	0.9883	0.0005
20	3	-0.0001	0.0004	0.9438	0.0285	-0.0006	NS	0.0127	0.8874
	5.5	0.0000	NS	0.0940	0.6934	0.0019	NS	0.6298	0.2064
	8	-0.0003	NS	0.4023	0.3057	0.0018	NS	0.4056	0.3631
21	3	-0.0003	NS	0.4196	0.2373	0.0020	NS	0.4261	0.2324
	5.5	-0.0014	0.0008	0.9104	0.0117	0.0049	NS	0.6089	0.1194
	8	-0.0030	0.0020	0.8914	0.0157	0.0384	0.0173	0.9431	0.0059
22	3	0.0168	NS	0.0828	0.5802	-0.0269	NS	0.4704	0.1326
	5.5	-0.0524	0.0516	0.6652	0.0479	-0.0043	NS	0.0316	0.7360
	8	-0.0742	0.0440	0.8455	0.0095	0.0036	NS	0.0188	0.7954
23	3	-0.0002	NS	0.0592	0.7567	0.0004	NS	0.0069	0.9170
	5.5	-0.0046	0.0027	0.9083	0.0121	0.0066	0.0040	0.9023	0.0134
	8	-0.0057	0.0032	0.9173	0.0103	0.0317	0.0098	0.9722	0.0020
24	3	-0.0036	0.0017	0.9361	0.0070	0.0026	0.0024	0.7936	0.0426
	5.5	-0.0059	0.0031	0.9238	0.0091	0.0071	0.0037	0.9274	0.0085
	8	-0.0069	0.0020	0.9765	0.0015	0.0181	0.0085	0.9374	0.0068
25	3	0.0002	NS	0.0733	0.7293	0.0009	NS	0.0307	0.8249
	5.5	0.0003	NS	0.0896	0.7006	0.0015	NS	0.2345	0.5157
	8	0.0001	NS	0.0974	0.6879	0.0025	NS	0.4579	0.3233
26	3	0.0009	NS	0.1195	0.6544	0.0179	NS	0.2945	0.4573
	5.5	0.0003	NS	0.2206	0.5303	0.1014	NS	0.5589	0.2524
	8	0.0007	NS	0.0457	0.7862	-0.0306	NS	0.3069	0.6262
27	3	0.0045	0.0023	0.7974	0.0028	-0.0039	0.0009	0.9492	0.0303
	5.5	0.0052	0.0048	0.6488	0.0158	-0.0036	0.0003	0.5701	0.0303
	8	0.0017	NS	0.0875	0.4767	0.0001	NS	0.0088	0.9836
28*	3	0.0250	0.0230	0.4810	0.0383	-0.0040	NS	0.1720	0.2670
	5.5	-0.0060	NS	0.3860	0.0740	0.0070	0.0060	0.5360	0.0249
	8	-0.0140	0.0040	0.8930	0.0001	0.0150	0.0080	0.7330	0.0032
29*	3	-0.0050	0.0050	0.5040	0.0484	0.0070		0.3390	0.1297
	5.5	-0.0170	0.0050	0.9250	0.0001	0.0130	0.0060	0.8130	0.0022
	8	-0.0230	0.0010	0.9960	0.0001	0.0560	0.0300	0.7880	0.0033
30	3	0.0005	NS	0.2190	0.5321	-0.0067	NS	0.2207	0.5302
	5.5	0.0005	NS	0.4047	0.3638	-0.0014	NS	0.3202	0.4342
	8	0.0004	NS	0.2938	0.4580	-0.0021	NS	0.2867	0.4645
31	3	0.0003	NS	0.1920	0.3251	0.0010	NS	0.0040	0.8996
	5.5	0.0002	NS	0.0680	0.5725	0.0110	NS	0.0950	0.5023
	8	0.0002	NS	0.0730	0.5569	0.0100	NS	0.2430	0.2615
32	3	no data	no data	no data	no data	no data	no data	no data	no data
	5.5	0.0050	0.0030	0.7990	0.0001	-0.0010	0.0018	0.3910	0.0222
	8	no data	no data	no data	no data	-0.0020	NS	0.7660	0.1250
33*	3	-0.0030	NS	0.1930	0.2759	0.0270	NS	0.2400	0.2181
	5.5	0.0060	NS	0.1030	0.4373	0.0060	NS	0.2760	0.1815
	8	no data	no data	no data	no data	no data	no data	no data	no data
34*	3	-0.0040	0.0015	0.8850	0.0002	0.0090	0.0040	0.7760	0.0017
	5.5	-0.0090	0.0020	0.9580	0.0001	0.0180	0.0130	0.6170	0.0121
	8	-0.0100	0.0020	0.9710	0.0001	0.0210	0.0150	0.5810	0.0169
NOTE: NS = NOT SIGNIFICANT; * RATES BASED ON DATA BEFORE AIR INJECTION CONDUCTED.									

Respiration Monitoring	Depth	Mean O2 Uptake Rate	95% CI	r <sup>2</sup>	p Value	Mean CO2 Production	95% CI	r <sup>2</sup>	p Value	Remarks
Point	(ft)	(%/hr)				rate (%/hr)				
1	3	-0.0400	0.0250	0.8990	0.0142	0.0040	NS	0.4970	0.1834	
	5.5	-0.0420	0.0150	0.9620	0.0031	0.0210	0.0130	0.8940	0.0152	
	8	-0.0680	0.0165	0.9830	0.0010	0.0250	0.0060	0.9820	0.0010	
2	3	-0.0280	0.0110	0.9550	0.0041	-0.0010	NS	0.1310	0.5493	
	5.5	-0.0440	0.0110	0.9820	0.0010	0.0120	0.0040	0.9670	0.0025	
	8	-0.0500	0.0080	0.9920	0.0003	0.0120	0.0085	0.8640	0.0222	
3	3	-0.0600	0.0010	1.0000	0.0001	0.0100	0.0065	0.9510	0.0247	
	5.5	-0.0660	0.0075	0.9990	0.0007	0.0140	NS	0.5620	0.2507	
	8	-0.0530	0.0100	0.9960	0.0020	0.0070	0.0055	0.9260	0.0375	
4	3	-0.0320	0.0145	0.9410	0.0061	0.0110	0.0090	0.8400	0.0285	no air injection
	5.5	-0.0530	0.0375	0.8670	0.0214	0.0330	NS	0.7150	0.0712	before shutdown
	8	-0.0360	NS	0.4910	0.1876	0.0110	NS	0.0920	0.6204	test
5	3	-0.0230	NS	0.7120	0.0725	0.0060	NS	0.0370	0.0757	pulsing test
	5.5	-0.0420	NS	0.1810	0.4745	0.0320	NS	0.3340	0.3071	well
	8	-0.0540	NS	0.1610	0.5033	0.0350	NS	0.1110	0.5844	
6	3	-0.0590	0.0365	0.9600	0.0201	0.0030	NS	0.1850	0.5695	pulsing test
	5.5	-0.0670	0.0455	0.9530	0.0240	0.0540	NS	0.7640	0.1261	well
	8	-0.0580	0.0230	0.9830	0.0086	0.0600	NS	0.7400	0.1397	
7	3	0.0020	NS	0.0150	0.9216	-0.0100	NS	0.3630	0.5880	no air injection
	5.5	0.0140	NS	0.9590	0.1291	-0.1500	NS	0.9400	0.1570	before shutdown
	8	0.0200	NS	0.9870	0.0723	-0.0220	NS	0.9340	0.1655	test
8	3	-0.0010	NS	0.0410	0.8702	-0.0090	NS	0.6690	0.3899	no air injection
	5.5	0.0040	NS	0.8530	0.2508	-0.0140	NS	0.9360	0.1632	before shutdown
	8	-0.0050	0.0055	0.9940	0.0491	0.0020	NS	0.0990	0.7965	test
9	3	0.0100	NS	0.1270	0.6438	-0.0110	NS	0.2300	0.5202	no air injection
	5.5	0.0070	NS	0.1100	0.6678	-0.0120	NS	0.3830	0.3807	before shutdown
	8	0.0050	NS	0.0350	0.8135	-0.0130	NS	0.1870	0.5675	test
10	3	-0.0003	NS	0.0001	0.9851	-0.0080	NS	0.2540	0.3863	pulsing test
	5.5	-0.0180	NS	0.4140	0.2414	0.0090	NS	0.7050	0.0751	well
	8	-0.0370	0.0295	0.8420	0.0281	0.0400	0.0400	0.9940	0.0002	
11	3	0.0005	NS	0.0002	0.9828	-0.0330	NS	0.6390	0.1044	pulsing test
	5.5	-0.0490	0.0415	0.8240	0.0331	0.0140	NS	0.5960	0.1261	well
	8	-0.0670	0.0560	0.8260	0.0325	0.0710	0.0715	0.8090	0.0378	
12	3	0.0230	NS	0.3780	0.2696	-0.0120	NS	0.1840	0.4706	no air injection
	5.5	0.0230	NS	0.6750	0.0880	-0.0090	0.0070	0.8360	0.0297	before shutdown
	8	0.0220	NS	0.5780	0.1356	-0.0080	NS	0.1170	0.5726	test
13	3	-0.0160	NS	0.1360	0.5414	0.0050	NS	0.0150	0.8420	pure oxygen
	5.5	-0.0020	NS	0.0080	0.8879	-0.0250	NS	0.3240	0.3166	test well
	8	-0.0050	NS	0.1190	0.5696	0.0130	NS	0.3240	0.3162	
14	3	-0.0060	0.0053	0.7940	0.0423	0.0070	NS	0.5980	0.1252	pure oxygen
	5.5	-0.0050	NS	0.2620	0.3775	0.0120	NS	0.5660	0.1424	test well
	8	-0.0100	NS	0.1640	0.4988	0.0080	NS	0.0810	0.6431	
15	3	0.0060	NS	0.1650	0.4977	-0.0110	NS	0.5790	0.1350	pulsing test
	5.5	0.0100	NS	0.5840	0.1325	-0.0030	NS	0.3050	0.3341	well
	8	0.0090	NS	0.0600	0.1242	-0.0003	NS	0.0020	0.9366	
16	3	-0.0010	NS	0.0060	0.9039	0.0010	NS	0.0640	0.6807	pulsing test
	5.5	-0.0030	NS	0.0350	0.7632	0.0040	NS	0.1890	0.4645	well
	8	-0.0180	NS	0.4530	0.2133	0.0080	NS	0.7530	0.0566	
17	3	-0.0180	NS	0.3750	0.2721	0.0110	NS	0.4450	0.2188	no air injection
	5.5	-0.0300	NS	0.6870	0.0830	0.0190	NS	0.6140	0.1167	before shutdown
	8	-0.0430	0.0330	0.8490	0.0261	0.0470	0.0475	0.8700	0.0207	test
18	3	-0.0350	NS	0.6050	0.1214	0.0180	NS	0.4910	0.1873	pure oxygen

Respiration		Mean O2				Mean CO2				
Monitoring	Depth	Uptake Rate				Production				Remarks
Point	(ft)	(%/hr)	95% CI	r <sup>2</sup>	p Value	rate (%/hr)	95% CI	r <sup>2</sup>	p Value	
	5.5	-0.0440	0.0400	0.8070	0.0384	0.0500	0.0495	0.7920	0.0431	test well
	8	-0.0380	NS	0.5750	0.1373	0.0430	NS	0.4670	0.2032	
19	3	0.0110	NS	0.1690	0.4919	0.0120	NS	0.4130	0.2421	pure oxygen
	5.5	-0.0240	NS	0.3800	0.2681	0.0560	NS	0.5800	0.1346	test well
	8	-0.0460	NS	0.6380	0.1053	0.0900	NS	0.7300	0.0652	
24	3	-0.0450	0.0265	0.9030	0.0131	0.0080	0.0155	0.4930	0.1864	
	5.5	-0.0560	0.0175	0.9710	0.0021	0.0160	0.0075	0.9370	0.0068	
	8	-0.0540	0.0225	0.9510	0.0047	0.0170	0.0045	0.9810	0.0011	
27	3	-0.0150	NS	0.6090	0.1196	0.0140	NS	0.4700	0.2011	
	5.5	-0.0610	0.0350	0.9090	0.0119	0.0370	0.0200	0.9220	0.0095	
	8	-0.0870	0.0640	0.8620	0.0226	0.0550	0.0170	0.9730	0.0019	
28	3	-0.0750	0.0555	0.8590	0.0236	0.0300	0.0245	0.8310	0.0311	
	5.5	-0.0910	0.0595	0.8860	0.0168	0.0540	0.0475	0.8110	0.0371	
	8	-0.1380	NS	0.0023	0.9690	0.0790	0.0275	0.9660	0.0026	
29	3	-0.0840	0.0640	0.8530	0.0250	0.0600	0.0515	0.8190	0.0345	
	5.5	-0.0910	0.0385	0.9500	0.0048	0.0530	0.0225	0.9490	0.0050	
	8	-0.1450	0.0560	0.9580	0.0038	0.0880	0.0260	0.9750	0.0017	
32	3	0.0150	NS	0.0400	0.2521	0.0090	NS	0.4020	0.2503	
	5.5	-0.0080	NS	0.0670	0.6753	0.0260	NS	0.5120	0.1739	
	8	-0.0400	NS	0.4020	0.3661	0.0820	NS	0.7210	0.1511	
33	3	0.0190	NS	0.4820	0.1932	0.0240	0.0235	0.7890	0.0441	
	5.5	-0.0220	NS	0.4330	0.2276	0.0280	0.0255	0.8100	0.0375	
	8	-0.0280	NS	0.3810	0.2676	0.0500	NS	0.7560	0.0555	
34	3	-0.0690	NS	0.8800	0.0620	0.0380	0.0370	0.9070	0.0477	
	5.5	-0.0960	NS	0.8720	0.0661	0.0530	NS	0.8710	0.0669	
	8	-0.1180	NS	0.8500	0.0783	0.0630	NS	0.8640	0.0707	
NOTE: NS = NOT SIGNIFICANT										



Respiration Monitoring	Depth	Mean O2 Uptake Rate				Mean CO2 Production				Remarks
Point	(ft)	(1/hr)	95% L	r <sup>2</sup>	p Value	rate (1/hr)	95% CI	r <sup>2</sup>	p Value	
1	3	-0.0020	-0.0040	0.8890	0.0163	0.0010	NS	0.5100	0.1751	
	5.5	-0.0030	-0.0040	0.0958	0.0037	0.0060	0.0050	0.8380	0.0292	
	8	-0.0050	-0.0060	0.9870	0.0006	0.0060	0.0025	0.9550	0.0041	
2	3	-0.0020	-0.0020	0.9430	0.0058	-0.0010	NS	0.1170	0.5726	
	5.5	-0.0020	-0.0030	0.9870	0.0007	0.0060	0.0025	0.9600	0.0034	
	8	-0.0030	-0.0030	0.9940	0.0002	0.0060	0.0045	0.8490	0.0263	
3	3	-0.0040	-0.0040	0.9990	0.0007	0.0030	0.0025	0.9510	0.0250	
	5.5	-0.0040	-0.0050	0.9960	0.0020	0.0040	NS	0.6260	0.2088	
	8	-0.0030	-0.0040	0.9930	0.0033	0.0020	0.0014	0.9260	0.0375	
4	3	-0.0030	-0.0040	0.9360	0.0069	0.0010	0.0014	0.8160	0.0354	no air injection
	5.5	-0.0060	-0.0110	0.8790	0.0186	0.0030	NS	0.6980	0.0780	before shutdown
	8	-0.0050	-0.0150	0.4490	0.2160	0.0010	NS	0.0930	0.6168	test
5	3	-0.0010	-0.0030	0.7410	0.0610	0.0030	NS	0.0770	0.6514	pulsing test
	5.5	-0.0040	-0.0170	0.2020	0.4471	0.0050	NS	0.2790	0.3600	well
	8	-0.0070	-0.0330	0.1750	0.4835	0.0040	NS	0.1150	0.5764	
6	3	-0.0030	-0.0050	0.9740	0.0132	0.0010	NS	0.1860	0.5684	pulsing test
	5.5	-0.0040	-0.0070	0.9830	0.0172	0.0220	NS	0.6240	0.2100	well
	8	-0.0040	-0.0050	0.9870	0.0061	0.0230	NS	0.6120	0.2180	
7	3	-0.0002	-0.0110	0.0300	0.8890	-0.0020	NS	0.3630	0.5880	no air injection
	5.5	0.0010	-0.0010	0.9710	0.1083	-0.0020	NS	0.9370	0.1622	before shutdown
	8	0.0010	-0.0010	0.9850	0.0774	-0.0030	NS	0.9620	0.1251	test
8	3	-0.00003	-0.0020	0.0410	0.8702	-0.0010	NS	0.7210	0.3539	no air injection
	5.5	0.0004	-0.0020	0.8530	0.2508	-0.0010	NS	0.9360	0.1632	before shutdown
	8	-0.0010	-0.0010	0.9940	0.0491	0.0002	NS	0.2380	0.6754	test
9	3	0.0010	-0.0040	0.1180	0.6559	-0.0020	NS	0.2150	0.5369	no air injection
	5.5	0.0010	-0.0040	0.1380	0.6283	-0.0020	NS	0.3830	0.3807	before shutdown
	8	0.0005	-0.0060	0.0440	0.7906	-0.0010	NS	0.1710	0.5863	test
10	3	0.0000	-0.0030	0.0001	0.9903	-0.0010	NS	0.2370	0.4051	pulsing test
	5.5	-0.0010	-0.0040	0.4460	0.2181	0.0010	NS	0.6990	0.0776	well
	8	-0.0030	-0.0050	0.8310	0.0312	0.0060	0.0015	0.9850	0.0008	
11	3	0.0001	-0.0040	0.0040	0.9241	-0.0130	NS	0.6980	0.0781	pulsing test
	5.5	-0.0050	-0.0090	0.8230	0.0334	0.0010	NS	0.6140	0.1169	well
	8	-0.0430	-0.0830	0.7970	0.0416	0.0040	0.0034	0.7840	0.0459	
12	3	0.0020	-0.0030	0.4300	0.2298	-0.0010	NS	0.1500	0.5191	no air injection
	5.5	0.0030	-0.0010	0.6830	0.0844	-0.0010	0.0005	0.8150	0.0359	before shutdown
	8	0.0030	-0.0010	0.6120	0.1178	-0.0010	NS	0.1380	0.5377	test
13	3	-0.0030	-0.0130	0.1940	0.4576	0.0003	NS	0.0160	0.8375	pure oxygen
	5.5	-0.0010	-0.0090	0.0110	0.8652	-0.0010	NS	0.3460	0.2971	test well
	8	-0.0030	-0.0150	0.1390	0.5372	0.0005	NS	0.3380	0.3036	
14	3	-0.0003	-0.0010	0.6900	0.0813	0.0010	NS	0.5720	0.1391	pure oxygen
	5.5	-0.0010	-0.0020	0.3180	0.3218	0.0010	NS	0.5690	0.1407	test well
	8	-0.0010	-0.0060	0.1910	0.4616	0.0005	NS	0.0620	0.6875	
15	3	0.0004	-0.0010	0.1720	0.4881	-0.0030	NS	0.5460	0.1539	pulsing test
	5.5	0.0010	-0.0004	0.5370	0.1590	-0.0010	NS	0.3110	0.3288	well
	8	0.0005	-0.0004	0.5350	0.1604	0.0001	NS	0.0020	0.9426	
16	3	-0.0001	-0.0020	0.0070	0.8971	0.0003	NS	0.0640	0.6807	pulsing test
	5.5	-0.0020	-0.0020	0.0490	0.7206	0.0010	NS	0.1670	0.4946	well
	8	-0.0010	-0.0030	0.4980	0.1833	0.0020	0.0020	0.7790	0.0473	
17	3	-0.0010	-0.0040	0.4210	0.2363	0.0010	NS	0.4020	0.2508	no air injection
	5.5	-0.0020	-0.0050	0.6940	0.0796	0.0020	NS	0.5860	0.1314	before shutdown

Respiration		Mean O2				Mean CO2				Remarks
Monitoring	Depth	Uptake Rate				Production				
Point	(ft)	(1/hr)	95% L	r^2	p Value	rate (1/hr)	95% CI	r^2	p Value	
	8	-0.0030	-0.0060	0.8350	0.0301	0.0060	0.0045	0.8680	0.0212	test
18	3	-0.0050	-0.0130	0.6530	0.0981	0.0010	NS	0.4140	0.2416	pure oxygen
	5.5	-0.0080	-0.0160	0.8090	0.0378	0.0030	0.0030	0.7920	0.0430	test well
	8	-0.0070	-0.0190	0.5300	0.1634	0.0020	NS	0.4890	0.1885	
19	3	-0.0010	-0.0070	0.1310	0.5496	0.0010	NS	0.4220	0.2356	pure oxygen
	5.5	-0.0040	-0.0150	0.3590	0.2856	0.0030	NS	0.5870	0.1308	test well
	8	-0.0090	-0.0210	0.6480	0.1005	0.0050	NS	0.7010	0.0767	
24	3	-0.0030	-0.0050	0.8920	0.0155	0.0030	NS	0.4580	0.2094	
	5.5	-0.0030	-0.0050	0.9580	0.0037	0.0050	0.0025	0.9290	0.0081	
	8	-0.0030	-0.0050	0.9510	0.0047	0.0070	0.0030	0.9520	0.0046	
27	3	-0.0010	-0.0030	0.5900	0.1294	0.0030	NS	0.4720	0.2003	
	5.5	-0.0050	-0.0080	0.9190	0.0101	0.0060	0.0040	0.8850	0.0172	
	8	-0.0060	-0.0110	0.8760	0.0193	0.0130	0.0075	0.9130	0.0112	
28	3	-0.0080	-0.0150	0.8310	0.0310	0.0040	0.0033	0.8120	0.0367	
	5.5	-0.0130	-0.0220	0.8900	0.0159	0.0050	0.0045	0.8060	0.0386	
	8	-0.0160	-0.0230	0.9500	0.0048	0.0120	0.0065	0.9260	0.0088	
29	3	-0.0080	-0.0150	0.7930	0.0426	0.0090	0.0055	0.8780	0.0189	
	5.5	-0.0100	-0.0140	0.9370	0.0069	0.0080	0.0040	0.9340	0.0173	
	8	-0.0150	-0.0200	0.9690	0.0023	0.0170	0.0120	0.8730	0.0199	
32	3	0.0010	-0.0010	0.4250	0.2333	0.0010	NS	0.3750	0.2726	
	5.5	-0.0010	-0.0080	0.0400	0.7485	0.0020	NS	0.5170	0.1712	
	8	-0.0050	-0.6570	0.0100	0.9375	0.0040	0.0039	0.7850	0.0453	
33	3	0.0010	-0.0010	0.4970	0.1834	0.0040	0.0039	0.7850	0.0455	
	5.5	-0.0020	-0.0060	0.4140	0.2412	0.0030	0.0029	0.8010	0.0403	
	8	-0.0120	-0.0640	0.3350	0.4216	0.0030	NS	0.7470	0.0587	
34	3	-0.0040	-0.0090	0.8990	0.0521	0.0100	NS	0.8460	0.0805	
	5.5	-0.0070	-0.0130	0.9180	0.0420	0.0120	NS	0.8270	0.0906	
	8	-0.0100	-0.0190	0.8830	0.0603	0.0160	NS	0.8300	0.0890	
NOTE: NS = NOT SIGNIFICANT										

Respiration		Mean O2				Mean CO2				
Monitoring	Depth	Uptake Rate				Production				Remarks
Point	(ft)	(%/hr)	95% CI	r <sup>2</sup>	p Value	rate (%/hr)	95% CI	r <sup>2</sup>	p Value	
13	3	0.0091	0.0285	0.2000	0.4250	-0.0059	0.0093	0.4000	0.1568	pure oxygen
	5.5	-0.0049	0.1500	0.2000	0.3697	-0.0077	0.0122	0.4000	0.1518	test well
	8	-0.1000	0.0000	0.9000	0.0041	-0.0073	0.0245	0.1000	0.4496	
14	3	0.0095	0.0123	0.5000	0.0934	-0.0023	0.0040	0.4000	0.1856	pure oxygen
	5.5	0.0120	0.0178	0.5000	0.1280	-0.0036	0.0056	0.5000	0.1423	test well
	8	-0.0058	0.0160	0.2000	0.3657	0.0013	0.0109	0.0270	0.7547	
18	3	0.0100	0.0045	0.9000	0.0025	-0.0014	0.0075	0.1000	0.6294	pure oxygen
	5.5	0.0080	0.0079	0.6000	0.0748	-0.0010	0.0109	0.0170	0.8043	test well
	8	0.0100	0.0069	0.7000	0.0416	0.0022	0.0020	0.0350	0.7217	
19	3	-0.0220	0.0207	0.7000	0.0404	-0.0110	0.0108	0.7000	0.0450	pure oxygen
	5.5	-0.0450	0.0400	0.8000	0.0093	-0.0130	0.0142	0.6000	0.0656	test well
	8	-0.1000	0.0355	0.9000	0.0060	0.0067	0.0315	0.1000	0.5848	
NOTE: NS = NOT SIGNIFICANT										

Respiration		Mean O <sub>2</sub>				Mean CO <sub>2</sub>				
Monitoring	Depth	Uptake Rate				Production				Remarks
Point	(ft)	(1/hr)	95% CI	r <sup>2</sup>	p Value	rate (1/hr)	95% CI	r <sup>2</sup>	p Value	
13	3	0.0000	0.0017	0.0005	0.9683	-0.0006	0.0015	0.2000	0.3481	pure oxygen
	5.5	-0.0016	0.0047	0.2000	0.3922	-0.0004	0.0012	0.2000	0.4042	test well
	8	-0.0026	0.0012	0.9000	0.0032	-0.0009	0.0024	0.2000	0.3745	
14	3	0.0006	0.0010	0.4000	0.1847	-0.0005	0.0011	0.2000	0.4387	pure oxygen
	5.5	0.0006	0.0010	0.4000	0.1847					test well
	8	-0.0006	0.0010	0.4000	0.1658	0.0005	0.0016	0.2000	0.4433	
18	3	0.0011	0.0008	0.8000	0.0169	-0.0006	0.0010	0.4000	0.1632	pure oxygen
	5.5	0.0006	0.0010	0.4000	0.1839	-0.0006	0.0015	0.2000	0.3486	test well
	8	0.0012	0.0012	0.7000	0.0443	0.0004	0.0024	0.1000	0.6528	
19	3	-0.0011	0.0019	0.4000	0.1752	-0.0012	0.0020	0.4000	0.1637	pure oxygen
	5.5	-0.0020	0.0018	0.7000	0.0417	-0.0011	0.0008	0.8000	0.0178	test well
	8	-0.0027	0.0015	0.9000	0.0081	0.0004	0.0024	0.1000	0.6576	
NOTE: NS = NOT SIGNIFICANT										

Respiration		Mean				Mean CO <sub>2</sub>			
Monitoring	Depth	O <sub>2</sub> Uptake				Production			
Point	(ft)	Rate, %/hr	r <sup>2</sup>	p-value	95% CI	Rate, %/hr	r <sup>2</sup>	p-value	95% CI
3S	3	0.0011	0.0158	0.8403	0.0166	0.0039	0.3532	0.2906	0.0096
3M	5.5	-0.0079	0.6339	0.107	0.011	0.0043	0.3611	0.2839	0.0105
3D	8	-0.013	0.3587	0.2858	0.0321	0.0061	0.2035	0.4457	0.022
4S	3	-0.0027	0.0342	0.7659	0.0268	0.0085	0.6211	0.1133	0.0122
4M	5.5	0.0102	0.4337	0.2268	0.0213	0.0001	0.0002	0.9813	0.0114
4D	8	0.0029	0.049	0.7205	0.0232	0.0064	0.4666	0.2037	0.0126
5S	3	-0.0228	0.7435	0.0601	0.0246	0.0135	0.6299	0.1089	0.019
5M	5.5	-0.0024	0.0541	0.7065	0.0181	0.0031	0.151	0.518	0.0138
5D	8	-0.0047	0.0325	0.7719	0.0474	0.0094	0.0905	0.6228	0.0545
6S	3	-0.0204	0.5452	0.1542	0.0343	0.0163	0.6901	0.0814	0.02
6M	5.5	-0.0043	0.2642	0.3756	0.013	0.0009	0.0114	0.8641	0.0152
6D	8	-0.0024	0.0709	0.6651	0.0158	0.0037	0.0799	0.6451	0.023
10S	3	0.003	0.2559	0.3846	0.0094	0.0005	0.0032	0.9285	0.0163
10M	5.5	0.0029	0.1571	0.5089	0.0124	-0.0016	0.072	0.6625	0.0106
10D	8	-0.0004	0.0022	0.9401	0.016	-0.0016	0.072	0.6625	0.0106
11S	3	0.0017	0.0161	0.8387	0.0249	-0.0025	0.198	0.4528	0.0093
11M	5.5	-0.0008	0.0054	0.9065	0.0203	0.0026	0.068	0.6719	0.0176
11D	8	-0.0119	0.3839	0.265	0.0277	0.0107	0.2906	0.3485	0.0308
13S	3	-0.0178	0.576	0.1368	0.0281	0.0066	0.3356	0.306	0.0169
13M	5.5	-0.0172	0.9502	0.0048	0.0072	0.0048	0.4898	0.1882	0.009
13D	8	-0.0194	0.8784	0.0187	0.0133	0.0082	0.551	0.1508	0.0136
14S	3	-0.0135	0.6367	0.202	0.031	0.0169	0.9034	0.0495	0.0167
14M	5.5	-0.0052	0.4069	0.3621	0.0191	0.0091	0.9772	0.0115	0.0042
14D	8	0.0008	0.0909	0.6985	0.0079	0.0053	0.5729	0.2431	0.0138
15S	3	0.0017	0.0522	0.7177	0.0135	0.008	0.3192	0.321	0.0216
15M	5.5	-0.0024	0.3136	0.3262	0.0065	0.003	0.4334	0.227	0.0063
15D	8	-0.012	0.0521	0.7118	0.0094	0.0024	0.0989	0.6063	0.0135
16S	3	-0.0027	0.1143	0.5779	0.0137	0.0027	0.0975	0.609	0.0152
16M	5.5	-0.0003	0.0077	0.8887	0.0072	0.002	0.1935	0.4586	0.0076
16D	8	0.0032	0.4985	0.1827	0.0059	0.0022	0.1092	0.587	0.0114
18S	3	-0.0099	0.7126	0.0721	0.0116	0.0033	0.2866	0.3525	0.0096
18M	5.5	-0.0099	0.7196	0.0693	0.0114	0.0082	0.7526	0.0567	0.0086
18D	8	-0.0125	0.8764	0.0192	0.0086	0.0108	0.7425	0.0604	0.0117
19S	3	-0.021	0.8911	0.0158	0.0136	0.0073	0.595	0.1266	0.0111
19M	5.5	-0.0253	0.9166	0.0105	0.014	0.0082	0.807	0.0383	0.0074
19D	8	-0.0293	0.9333	0.0075	0.0144	0.0099	0.72	0.0691	0.0113
27S	3	-0.001	0.0147	0.8462	0.0158	-0.0007	0.0039	0.9203	0.0213
27M	5.5	0.0036	0.0817	0.6411	0.0224	-0.0055	0.212	0.4352	0.0194
27D	8	-0.0002	0.0003	0.9795	0.0181	-0.0071	0.206	0.4426	0.0256
28S	3	-0.0063	0.013	0.8554	0.101	0.0075	0.0485	0.675	0.046
28M	5.5	-0.0002	0.0001	0.9884	0.0298	-0.0083	0.2199	0.4256	0.0288
28D	8	0.0195	0.4244	0.2336	0.0417	-0.0303	0.7082	0.0739	0.0357

Respiration		Mean				Mean CO2			
Monitoring	Depth	O2 Uptake				Production			
Point	(ft)	Rate, %/hr	r <sup>2</sup>	p-value	95% CI	Rate, %/hr	r <sup>2</sup>	p-value	95% CI
29S	3	0.0191	0.8981	0.0143	0.0118	-0.005	0.3713	0.2753	0.012
29M	5.5	0.0011	0.0046	0.9137	0.0292	-0.0077	0.4096	0.2448	0.0168
29D	8	0.0014	0.0037	0.9092	0.0313	-0.009	0.1038	0.5335	0.0369
32S	3	-0.3908	0.8205	0.0342	0.3358	0.0144	0.8572	0.024	0.0108
32M	5.5	-0.4242	0.8479	0.0265	0.3305	0.024	0.9238	0.0091	0.0127
32D	8	-0.4468	0.625	0.1114	0.636	0.0308	0.8857	0.017	0.0203
33S	3	0.0045	0.3437	0.2989	0.0114	-0.0055	0.5521	0.1502	0.0091
33M	5.5	0.0049	0.2469	0.3944	0.0157	-0.0045	0.2006	0.4494	0.0166
33D	8	-0.0019	0.052	0.7121	0.0147	-0.0141	0.5915	0.1285	0.0214
34S	3	-0.0013	0.0042	0.918	0.0356	-0.0018	0.0272	0.7909	0.0204
34M	5.5	0.0035	0.0132	0.8539	0.0561	-0.0011	0.0119	0.8616	0.0178
34D	8	0.0043	0.0821	0.6403	0.0265	-0.0116	0.4447	0.2189	0.0238

Respiration		Mean				Mean CO <sub>2</sub>			
Monitoring	Depth	O <sub>2</sub> Uptake				Production			
Point	(ft)	Rate, l/hr	r <sup>2</sup>	p-value	95% CI	Rate, l/hr	r <sup>2</sup>	p-value	95% CI
3S	3	-9.44E-06	0.0002	0.9806	0.0011	0.0013	0.3268	0.314	0.0034
3M	5.5	-0.0005	0.592	0.1282	0.0008	0.0013	0.3611	0.2839	0.0031
3D	8	-0.001	0.3497	0.2936	0.0024	0.0017	0.2395	0.4028	0.0057
4S	3	-0.0003	0.0576	0.6975	0.002	0.0016	0.592	0.1265	0.0024
4M	5.5	0.0008	0.4171	0.2391	0.0018	0.0001	0.0039	0.9202	0.0016
4D	8	0.0003	0.049	0.7205	0.0023	0.0008	0.3122	0.3276	0.0023
5S	3	-0.0013	0.7082	0.0739	0.0015	0.004	0.5952	0.1265	0.006
5M	5.5	-0.0002	0.0541	0.7065	0.0018	0.0005	0.1946	0.4571	0.0018
5D	8	-0.0007	0.0377	0.7545	0.0061	0.0009	0.091	0.6218	0.0052
6S	3	-0.0012	0.5607	0.1453	0.002	0.0035	0.649	0.0998	0.0047
6M	5.5	-0.0003	0.3899	0.2601	0.0008	0.0002	0.0161	0.8387	0.0022
6D	8	-0.0001	0.0493	0.7196	0.0012	4.64E-05	0.0004	0.9756	0.0044
10S	3	0.0002	0.2181	0.4278	0.0006	0.0001	0.0051	0.9088	0.0037
10M	5.5	0.0002	0.1316	0.5485	0.0008	-0.0003	0.0887	0.6266	0.0019
10D	8	-0.0001	0.0165	0.8371	0.0012	-0.0008	0.3117	0.328	0.0023
11S	3	0.0002	0.0341	0.7663	0.0017	-0.0004	0.171	0.4889	0.0015
11M	5.5	3.47E-06	1.24E-05	0.9955	0.0016	0.0003	0.0456	0.7301	0.0022
11D	8	-0.0016	0.362	0.2831	0.004	0.0009	0.201	0.4489	0.0031
13S	3	-0.001	0.5328	0.1615	0.0017	0.002	0.3177	0.3224	0.0053
13M	5.5	-0.0011	0.9682	0.0024	0.0003	0.0013	0.4667	0.2036	0.0026
13D	8	-0.0012	0.8736	0.0199	0.0008	0.003	0.5429	0.1555	0.0051
14S	3	-0.0007	0.6544	0.1911	0.0015	0.006	0.8948	0.0541	0.0063
14M	5.5	-0.0003	0.4069	0.3621	0.0013	0.0024	0.9817	0.0092	0.001
14D	8	0.0001	0.0909	0.6985	0.0008	0.0017	0.8221	0.0933	0.0025
15S	3	0.0001	0.1236	0.5618	0.0007	0.0026	0.2919	0.3472	0.0073
15M	5.5	-0.001	0.3136	0.3262	0.0003	0.0009	0.4334	0.227	0.0019
15D	8	-0.0001	0.068	0.6719	0.0005	0.001	0.1236	0.5618	0.0048
16S	3	-0.0002	0.2432	0.3986	0.0007	0.0008	0.0975	0.609	0.0046
16M	5.5	5.90E-06	0.0018	0.9465	0.0003	0.0005	0.1932	0.4589	0.002
16D	8	0.0002	0.4527	0.2133	0.0004	0.0012	0.3198	0.3204	0.0033
18S	3	-0.0006	0.6813	0.0852	0.0008	0.0008	0.3355	0.3061	0.002
18M	5.5	-0.0007	0.7031	0.076	0.0008	0.0016	0.7526	0.0567	0.0017
18D	8	-0.0008	0.8538	0.0249	0.0006	0.0026	0.7657	0.052	0.0026
19S	3	-0.0012	0.9256	0.0088	0.0007	0.0022	0.5674	0.1416	0.0035
19M	5.5	-0.0016	0.9308	0.0079	0.0008	0.0024	0.8051	0.0389	0.0022
19D	8	-0.0019	0.9394	0.0064	0.0008	0.0026	0.7627	0.0531	0.0026
27S	3	-0.0001	0.0109	0.8672	0.001	-0.0001	0.0022	0.9399	0.0054
27M	5.5	0.0003	0.0866	0.6308	0.0017	-0.0009	0.2186	0.4272	0.003
27D	8	2.91E-05	0.0013	0.954	0.0015	-0.0013	0.3098	0.3299	0.0034
28S	3	-0.0003	0.0038	0.9212	0.0084	0.0016	0.089	0.5659	0.0072
28M	5.5	7.39E-06	7.52E-06	0.9959	0.0037	-0.0008	0.1953	0.4562	0.0031
28D	8	0.0059	0.3435	0.299	0.0149	-0.0021	0.7811	0.0467	0.0021

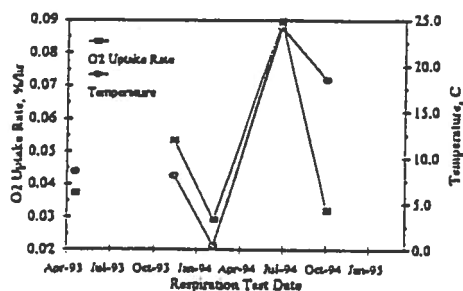
Respiration		Mean				Mean CO <sub>2</sub>			
Monitoring	Depth	O <sub>2</sub> Uptake				Production			
Point	(ft)	Rate, 1/hr	r <sup>2</sup>	p-value	95% CI	Rate, 1/hr	r <sup>2</sup>	p-value	95% CI
29S	3	0.0015	0.8811	0.0181	0.001	-0.0009	0.4047	0.2485	0.0019
29M	5.5	0.0001	0.0042	0.9179	0.004	-0.0008	0.4096	0.2448	0.0017
29D	8	0.0004	0.0081	0.8651	0.0065	-0.0011	0.261	0.3004	0.0027
32S	3	-0.0104	0.8531	0.025	0.0079	0.0092	0.8292	0.0317	0.0077
32M	5.5	-0.016	0.8431	0.0277	0.0127	0.0071	0.9406	0.0063	0.0033
32D	8	-0.0208	0.7004	0.0771	0.025	0.0088	0.8629	0.0225	0.0064
33S	3	0.0003	0.3616	0.2834	0.0007	-0.0014	0.5114	0.1745	0.0024
33M	5.5	0.0003	0.3134	0.3264	0.0009	-0.0008	0.1677	0.4936	0.0032
33D	8	-0.0086	0.3619	0.3984	0.0347	-0.0013	0.4719	0.2001	0.0025
34S	3	-0.0001	0.003	0.9307	0.0023	-0.0003	0.0173	0.8332	0.0034
34M	5.5	0.0004	0.0238	0.8045	0.0043	-0.0001	0.0109	0.867	0.0025
34D	8	0.0004	0.0765	0.6525	0.0023	-0.0012	0.3115	0.3282	0.0034



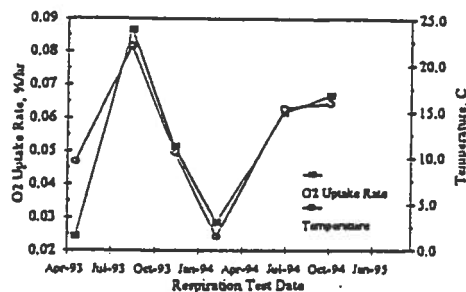
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**APPENDIX 19**  
**TEMPERATURE AND RESPIRATION RATE PLOTS**

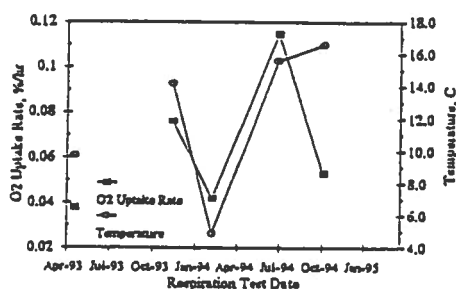
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP4S



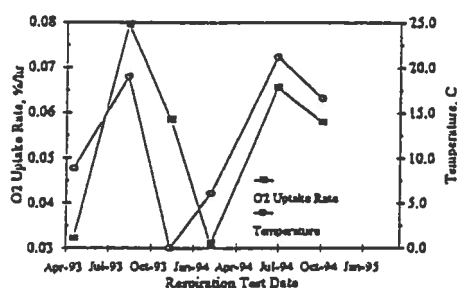
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP6M



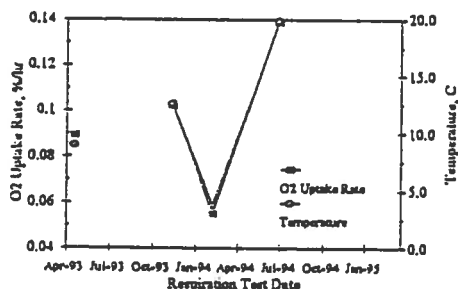
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP4M



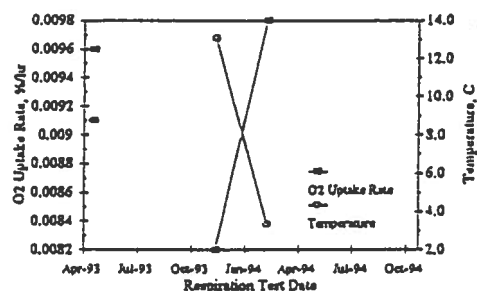
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP6D



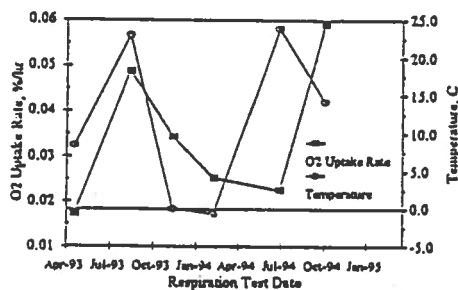
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP4D



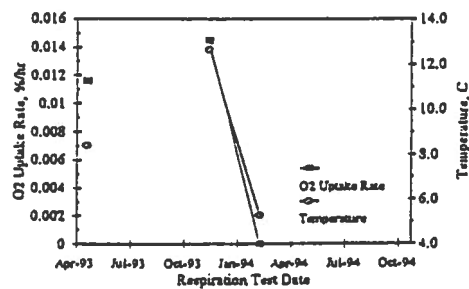
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP7M



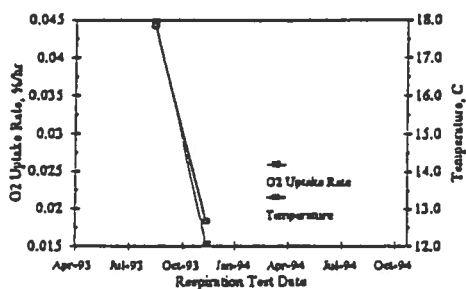
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP6S



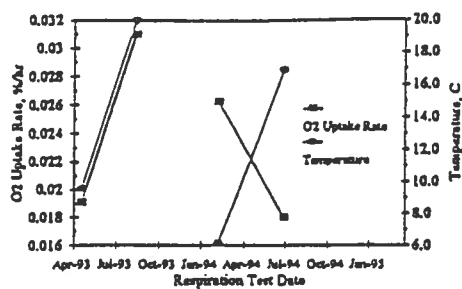
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP7D



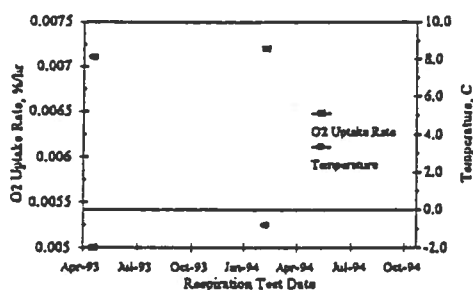
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP8D



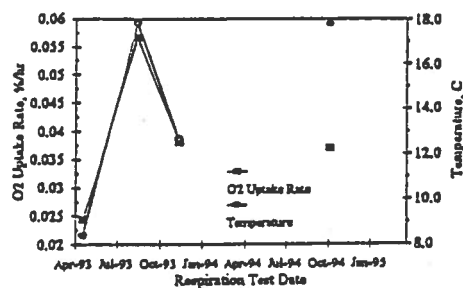
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP10M



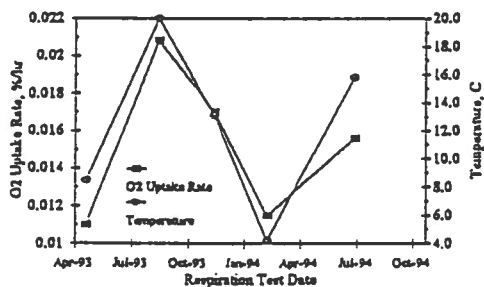
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP9S



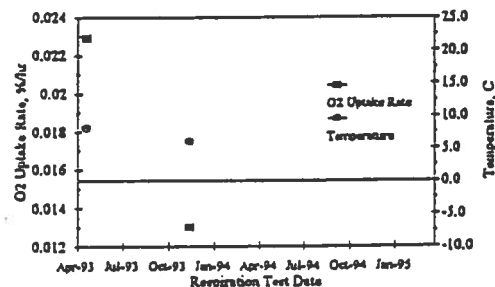
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP10D



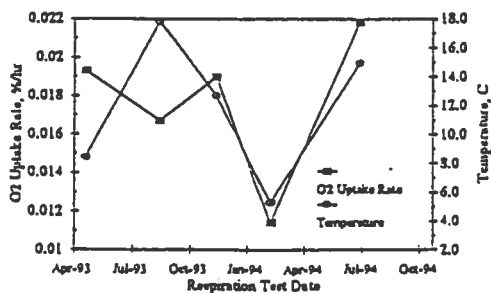
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP9M



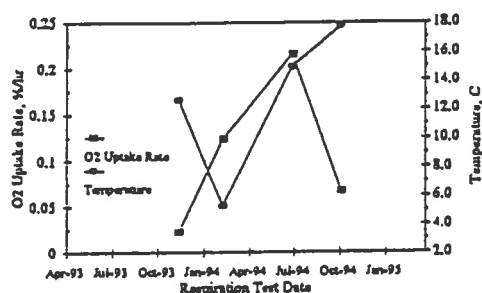
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP11S



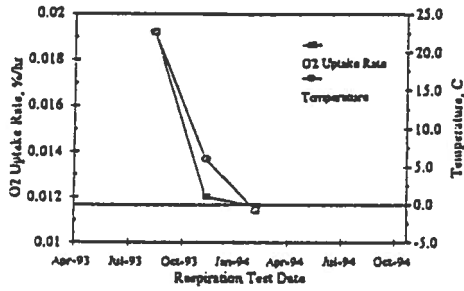
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP9D



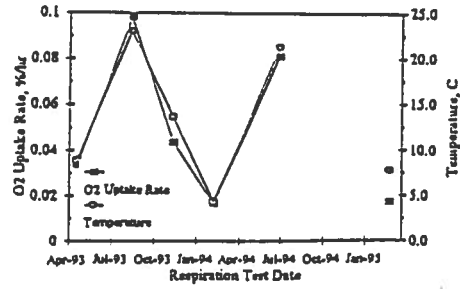
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP11D



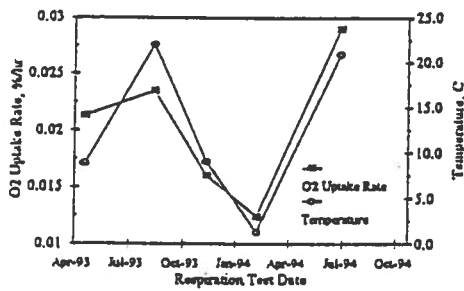
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP12S



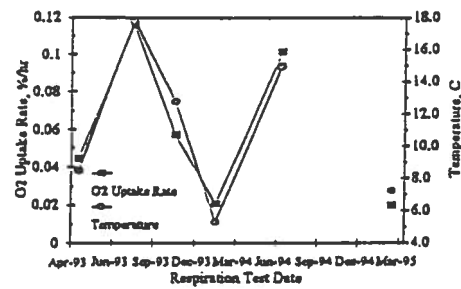
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP13M



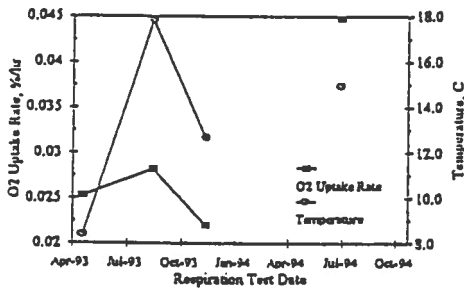
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP12M



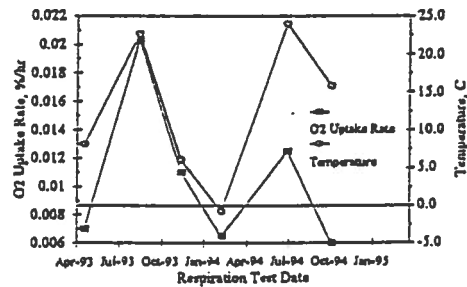
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP13D



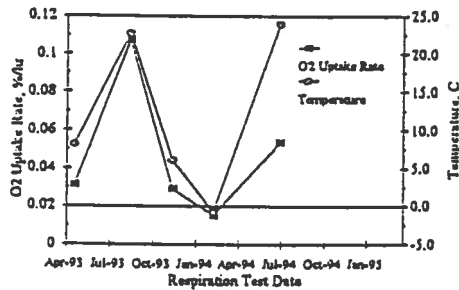
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP12D



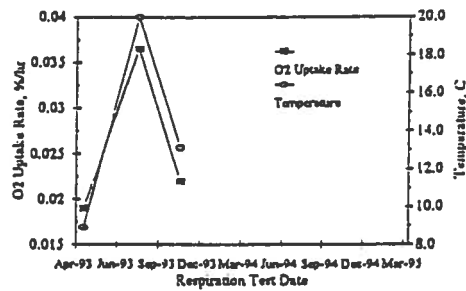
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP14S



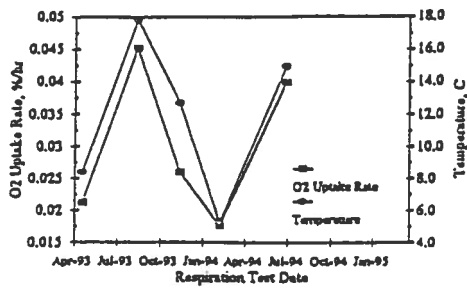
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP13S



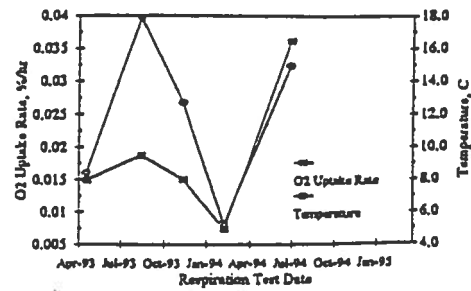
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP14M



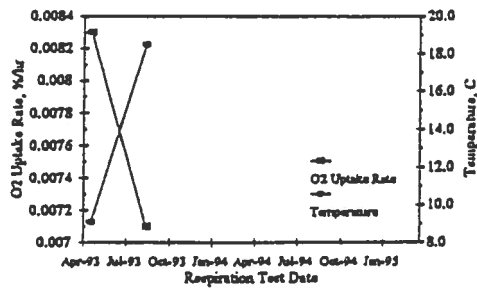
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP14D



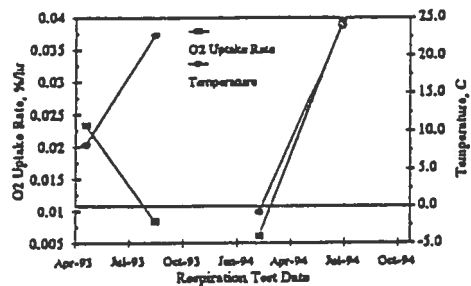
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP16D



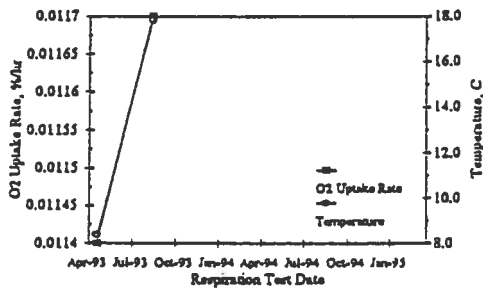
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP15M



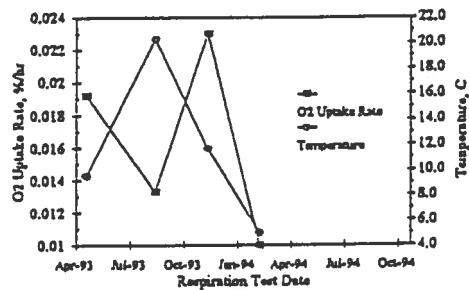
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP17S



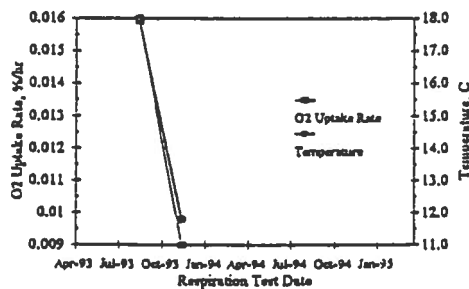
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP15D



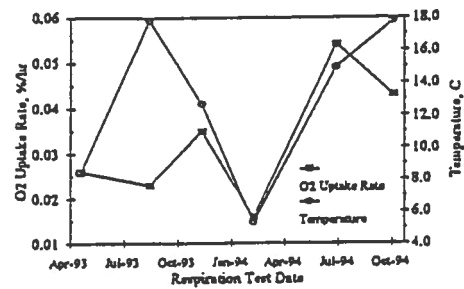
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP17M



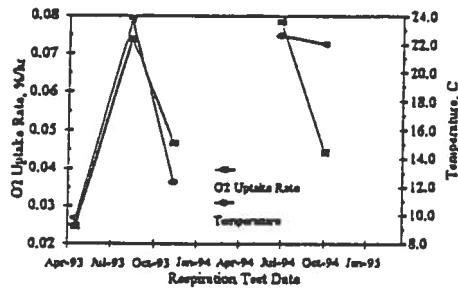
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP16M



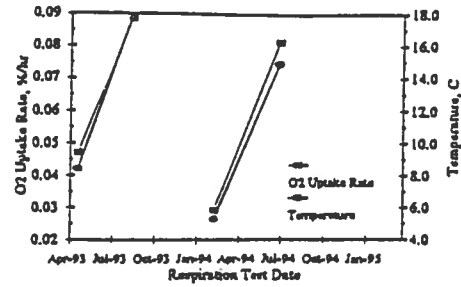
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP17D



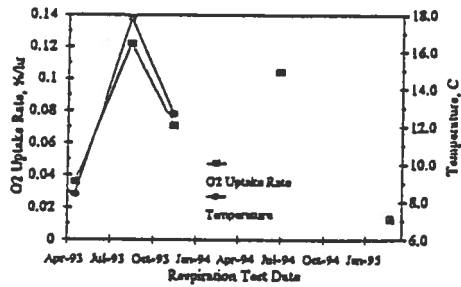
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP18M



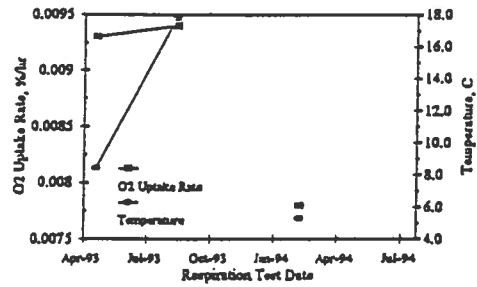
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP19D



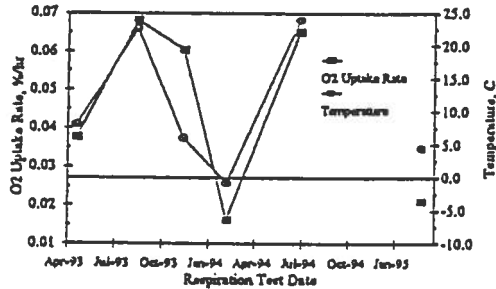
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP18D



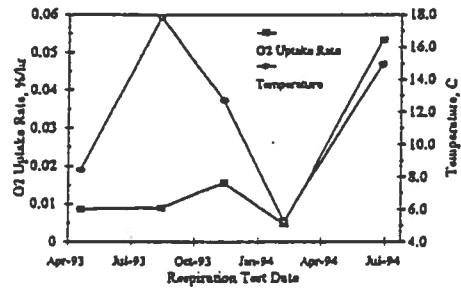
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP20D



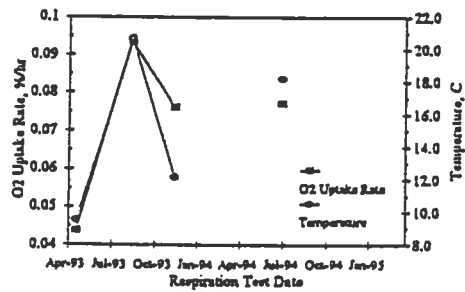
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP19S



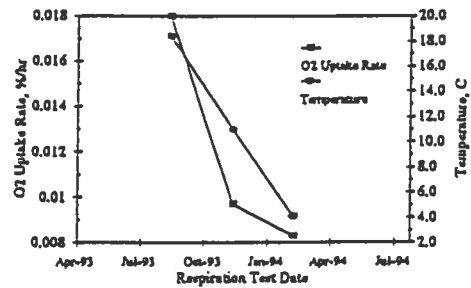
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP21D



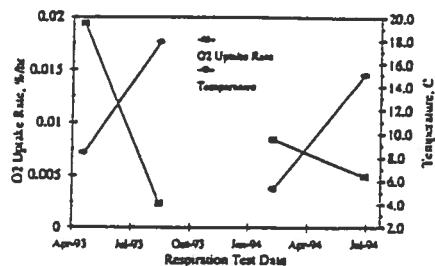
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP19M



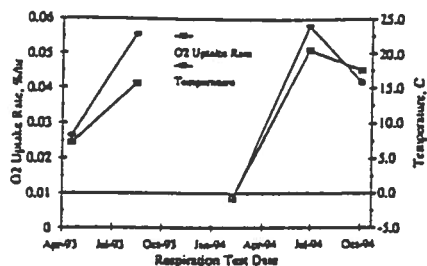
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP22M



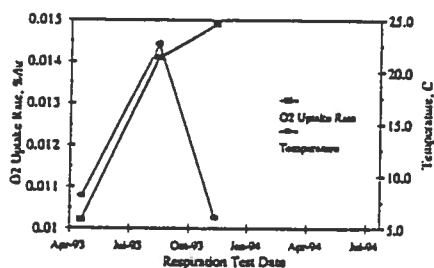
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP22D



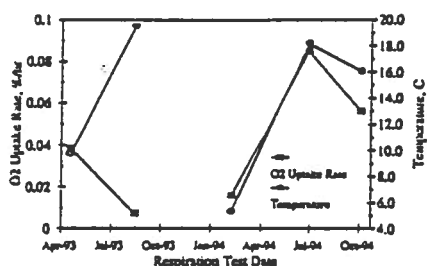
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP24S



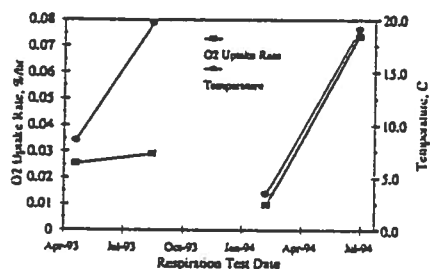
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP23S



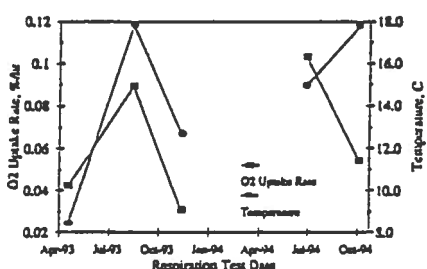
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP24M



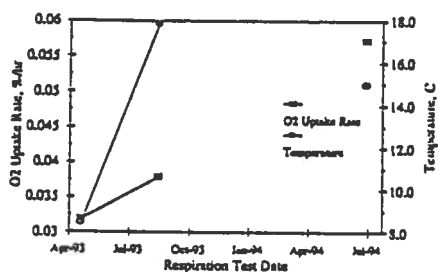
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP23M



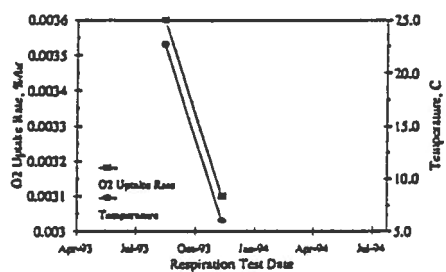
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP24D



Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP23D

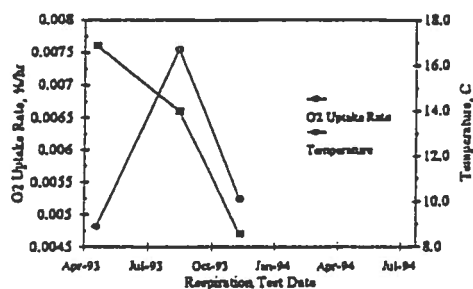


Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP26S

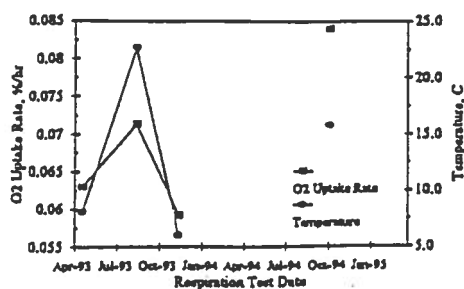




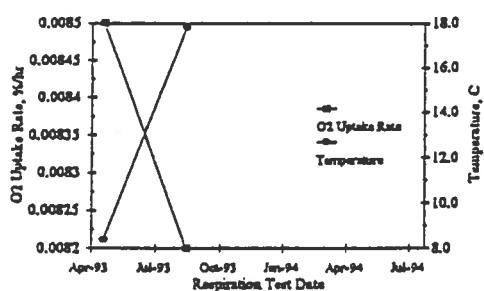
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP26M



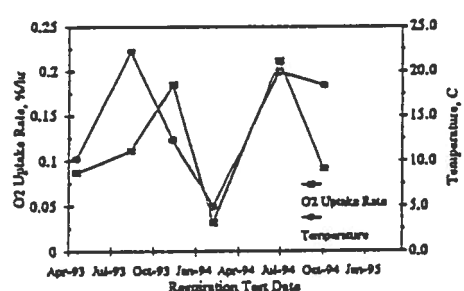
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP29S



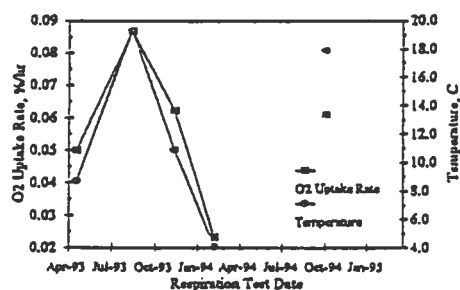
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP26D



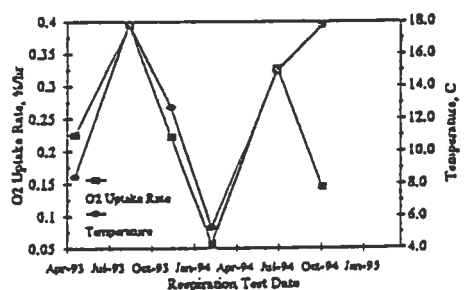
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP29M



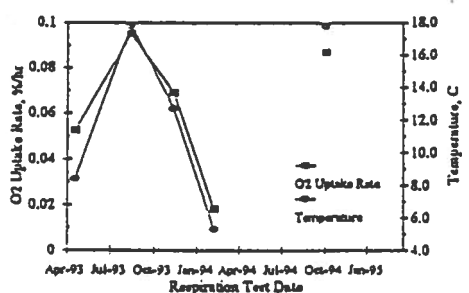
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP27M



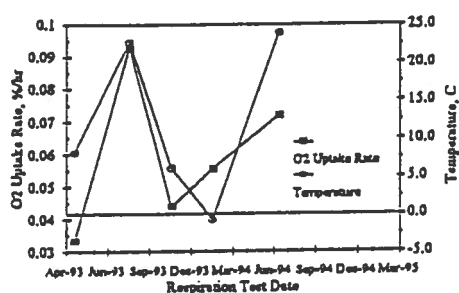
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP29D



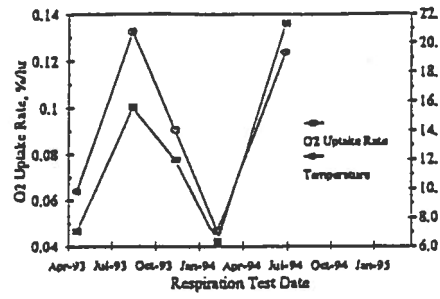
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP27D



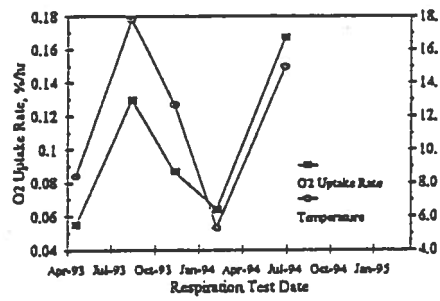
Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP34S



Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP34M



Zero Order O<sub>2</sub> Uptake Rate and  
Subsurface Temperature, MP34D



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**APPENDIX 20**  
**TEMPERATURE CORRECTION REGRESSION RESULTS**

Simple Regression  $X_1: 1/T(\text{abs})$   $Y_1: \ln(r)$

Count:	R:	R-squared:	Adj. R-squared:	RMS Residual:
77	.648	.42	.412	.546

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	1	16.171	16.171	54.237
RESIDUAL	75	22.361	.298	$p = .0001$
TOTAL	76	38.532		

No Residual Statistics Computed

Note: 25 cases deleted with missing values.

Simple Regression  $X_1: 1/T(\text{abs})$   $Y_1: \ln(r)$

Beta Coefficient Table

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	t-Value:	Probability:
INTERCEPT	16.343				
SLOPE	-5571.224	756.486	-.648	7.365	.0001

Confidence Intervals Table

Variable:	95% Lower:	95% Upper:	90% Lower:	90% Upper:
MEAN (X,Y)	-3.322	-3.074	-3.302	-3.095
SLOPE	-7078.372	-4064.076	-6831.212	-4311.236

## **APPENDIX 21**

### **CALCULATION OF MEAN SUBSURFACE TEMPERATURE AT FPTA NO. 1**

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Monitoring Point	4/21/93	6/4/93	6/28/93	8/1/93	9/20/93	10/16/93	11/17/93	12/17/93	1/15/94	2/12/94	2/28/94	3/26/94	4/23/94	6/2/94	7/7/94	8/25/94	9/23/94	10/13/94	12/3/94	1/18/95	3/6/95
1	Temp	7.1	12.6	15.6	19.9	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp
2		6	12.1			15	9	3.3	4.9	2.3	1.3	4.0	6.2		19.1	20.3	19.4	17.4	7.5		5.8
3		7.4	13.5	15.4	20.5	17	12	3.6	6.3	2.8	3.8	4.8	5.4	13.3	18.3	20.1	19.8	17.8	10.3		7
4		8.8	13.7	13.1	23.7	16.8	14.5	8.3	8.9	5.2	7.1	7.6	8.2	12.1	14.8	17.6	17.9	17.2	12.6	10.2	9.4
5		7.9	12.3	18.4	22.1	15	9.7	3	4.3	0.5	1.2	5.6	8.4	16.6	22.2	23.1	20.3		12.5	4.6	5.6
6		9.4	15.5	13.5	18.7	16.3	13.6	7	8.6	4.6	5.8	6.4	6.8	11.6	15.4	17.4	17.6	16.7	12.1	9.8	7
7		8.8	12.3	15.4	19.8	20	14.9	9.1	6.2	2.5	3.7	4.9	6.6	13.4	18.5	19.7	18.7	16.8			
8		8.7	13.6	16	21.4	16.2	12.4	5.4	6.6	2.2	3.8	4.8	7.3	14.0	19.7	21.2	20.8	18.7			7.2
9		8.2		13.3	19.7	17.2	12.6	7.4	7.8	3.4	4.0	4.1	5.3	11.1	16.3	19.1	19.8	19.2	13.2		8
10		8.8	14	14.4	20.2	17.9	14.5	8.3	9.0	5.1	6.4	6.0	6.0	12.3	17.1	20.2	20.2	19.8	13.7	10.0	9.1
11		8.7	15.1	16.8	21.5	16.2	10.8	5.5	6.7	3.1	4.0	6.7	8.4	15.1	19.9	21.5	20.1	16.9	9.2	6.6	7.8
12		8.8	16.1	17.9	22	15.6	6.1	3.6	4.0	0.6	1.4	5.3	7.2	16.7	20.8	21.4	20.0	16.6	6.3	4.6	6.5
13		9.2	14	16.6	23.2	18.9	12.1	7.2	7.0	3.4	4.7	5.2	6.2	13.7	20.1	23.9	23.9	21.3	12.2	8.4	7.6
14		8.4	12	13.7	19.6	17.9	10.1	8.1	8.1	3.7	4.9	4.8	5.5	14.4	16	20.2	20.4	20	13.5	9.8	7.7
15		9.5	14.1	14.7	18	13.5	10	5.2	5.2	2.5	3.5	6.3	7.5	13.4	17.6	18.8	29.6	15	8.7	7.0	7.5
16		10	12.7	13.5	17.7	14.4	11.5	6.7	7.0	4.1	5.9	6.3	7.1	12.5	15.7	17.9	17.1	16.2			
17		9.4	15.3	15.5	20	16.2	10.2	6.5	6.7	3.9	5.0	7.0	8.1	14.3	18.8	20.8	19.6	17.8			8.8
18		9.1	14.8	17.3	23.4	19.5	11.4	8.1	7.7	4.6	5.7	6.8	6.8	16.6	21.6	24.3	24.2	21.8	13.7	10.0	9.4
19		9.2	12.9	14.7	20.8	18.1	11.8	8.9	9.2	4.9	6.0	6.2	7.1	11.0	17.9	22.3					
20		9.7	11.4	12.1	16.6	18.2	13.9	6	5.8	4.0	6.8	4.8	5.4	11.0	14.6	16.7					7.2
21		9.6	12.5	13.6	17.5	13.6	10.3	4.1	4.5	3.8	2.8	4.4	6.1	12.4	17	18.1				7.0	6.6
22		9.3	12.1	12.9	17.8	14.6	11.6	5	6.2	6.7											
23		8.7	13.4	15.2	19.3	18.2	14	10.7	4.8	6.6	3.4	5.4	7.4	14.3	19.2	20.0				7.2	7.5
24		9.8	13.9	14.5	18.7	18.5	11.7	5.2	6.0	5.8	5.1	7.1	7.9	13.9	17.7	18.9	18.2	16.6	10.6		9.2
25		8.3	10.8	10.4	15.7	16.6	8.8	5.6	6.7	4.4	5.0	5.4	5.0	10.0	12.9	15.5	14.8			9.3	8.6
26		8.8	11.1	11.6	16.4	16.7	9	5.6	6.8	4.6	4.9	4.9	5.5	10.5	13.6	15.9	15.8			8.4	8.2
27		9	12.4	13.4	19.2	18.9	15.7	9.4	6.4	4.3	4.0	4.8	6.1	12.1	18.5	19.5	19.4	18	11.3	6.7	8.2
28		14.5	15.5	15.5	20.8	17.2	11.7	7.6	8.4	6.7	6.5	7.5	8.2	14.2	16.4	22.2	21.9	20.9	14.0	10.6	9.5
29		10	15.4	16.5	21.5	20.4	17.8	13.7	6.2	4.7	4.5	7.2	7.9	14.7	19.3	21.0	21.0	18.8	11.9	8.6	8
30		7.4	11.3	12	16.4	16.3	12.6	7.3	4.4	3.7	2.7	3.9	4.7	11.1	14.3	15.3				6.6	6.7
31		7.9	11.2	11.2	15.7	16.2	8.6	5.4	5.0	7.2	4.0	5.0	5.5	10.8	14	15.6				7.6	7.5
32		9.2	12.7	14	17.9	17.7	10.3	6.8	6.6	5.0	5.6	6.2	7.3	13.2	16.6	18.9	18.0	16.7	10.9	8.5	9
33		9.7	12.2	13.2	16.9	16.5	14.4	11.9	8.7	5.4	6.2	6.2	6.7	12.3	15.4	18.5	18.0	17.3	12.6	10.6	9.3
34		10	14.5	16.2	21	19.6	13.9	9.8	10.3	6.3	7.3	7.5	7.5	14.5	18	22.4	22.6	21.2	14.7	11.4	10.7
Average		8.8	13.2	14.5	19.5	15.5	11.0	6.1	6.7	4.2	4.5	5.7	6.7	13.1	17.4	19.6	20.0	18.2	11.6	8.3	8.0
																			Annual Average		12.0



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## **APPENDIX 22**

### **TEMPERATURE-CORRECTED RESPIRATION RATES FOR MONITORING POINTS USED IN TEMPERATURE-CORRECTION REGRESSION**

Arrhenius  
slope  
Mean -5571  
Upper 95% CL -7078  
Lower 95% CL -4064  
St. temp, C 12

Monitoring Point		4/19/93	Upper CL	Lower CL	95% CI	8/16/93	Upper CL	Lower CL	95% CI
4D	Resp rate	0.085			0.06				
	Temp	8.9	8.9	8.9	8.9				
	Corr rate	0.110	0.1766	0.0439	0.0663				
6M	Resp rate	0.024			0.0193	0.0866			0.0751
	Temp	9.6	9.6	9.6	9.6	22.0	22.0	22.0	22.0
	Corr rate	0.023	0.0493	0.0081	0.0206	0.0446	0.1285	-0.0378	0.0831
9M	Resp rate	0.011			0.004	0.0208			0.0139
	Temp	8.4	8.4	8.4	8.4	20.0	20.0	20.0	20.0
	Corr rate	0.014	0.0191	0.0092	0.0049	0.0122	0.0280	-0.0033	0.0157
12M	Resp rate	0.021			0.0131	0.0235			0.0090
	Temp	8.3	8.8	8.8	8.8	22.0	22.0	22.0	22.0
	Corr rate	0.026	0.041	0.0119	0.0147	0.0121	0.0235	0.0011	0.0112
13S	Resp rate	0.031			0.0194	0.1074			0.0608
	Temp	8.1	8.1	8.1	8.1	22.7	22.7	22.7	22.7
	Corr rate	0.0408	0.0633	0.0185	0.0224	0.0530	0.1250	-0.0170	0.0710
13M	Resp rate	0.033			0.0135	0.0980			0.0442
	Temp	9.0	9.0	9.0	9.0	23.0	23.0	23.0	23.0
	Corr rate	0.041	0.0573	0.0256	0.0158	0.0474	0.1019	-0.0053	0.0536
13D	Resp rate	0.044			0.0097	0.1161			0.0262
	Temp	8.4	8.4	8.4	8.4	17.8	17.8	17.8	17.8
	Corr rate	0.057	0.0703	0.0437	0.0136	0.0785	0.1135	0.0444	0.0345
14D	Resp rate	0.021			0.0096	0.0452			0.0170
	Temp	8.4	8.4	8.4	8.4	17.8	17.8	17.8	17.8
	Corr rate	0.027	0.0387	0.0158	0.0114	0.0306	0.0510	0.0105	0.0202
18D	Resp rate	0.036			0.026	0.1219			0.0578
	Temp	8.4	8.4	8.4	8.4	17.8	17.8	17.8	17.8
	Corr rate	0.046	0.0755	0.0172	0.0291	0.0824	0.1494	0.0163	0.0665
19S	Resp rate	0.037			0.0116	0.0681			0.0253
	Temp	8.1	8.1	8.1	8.1	22.7	22.7	22.7	22.7
	Corr rate	0.049	0.0647	0.0342	0.0152	0.0336	0.0660	0.0025	0.0318
19D	Resp rate	0.047			0.01	0.0885			0.0180
	Temp	8.4	8.4	8.4	8.4	17.8	17.8	17.8	17.8
	Corr rate	0.060	0.0745	0.0464	0.0141	0.0598	0.0845	0.0358	0.0243
24S	Resp rate	0.024			0.0217	0.0410			0.0367
	Temp	8.1	8.1	8.1	8.1	22.7	22.7	22.7	22.7
	Corr rate	0.031	0.0559	0.0078	0.0240	0.0202	0.0612	-0.0200	0.0406
27M	Resp rate	0.049			0.0147	0.0868			0.0574
	Temp	8.7	8.7	8.7	8.7	19.3	19.3	19.3	19.3
	Corr rate	0.062	0.0814	0.0443	0.0186	0.0533	0.1182	-0.0107	0.0645
27D	Resp rate	0.052			0.0319	0.0951			0.0302
	Temp	8.4	8.4	8.4	8.4	17.8	17.8	17.8	17.8
	Corr rate	0.067	0.1040	0.0311	0.0365	0.0643	0.1017	0.0276	0.0370
34M	Resp rate	0.046			0.0142	0.1004			0.0241
	Temp	9.8	9.8	9.8	9.8	20.8	20.8	20.8	20.8
	Corr rate	0.054	0.0706	0.0378	0.0164	0.0559	0.0896	0.0236	0.0330

Arrhenius  
slope  
Mean -5571  
Upper 95% CL -7078  
Lower 95% CL -4064  
St. temp, C 12

Monitoring Point		11/15/93	Upper CL	Lower CL	95% CI	2/12/94	Upper CL	Lower CL	95% CI
4D	Resp rate	0.1020			0.0170	0.0550			0.0153
	Temp	12.6	12.6	12.6	12.6	3.7	3.7	3.7	3.7
	Corr rate	0.0979	0.1160	0.0798	0.0181	0.0987	0.1309	0.0690	0.0310
6M	Resp rate	0.0514			0.0223	0.0286			0.0057
	Temp	10.6	10.6	10.6	10.6	1.6	1.6	1.6	1.6
	Corr rate	0.0565	0.0802	0.0328	0.0237	0.0602	0.0793	0.0436	0.0178
9M	Resp rate	0.0170			0.0070	0.0115			0.0017
	Temp	13.1	13.1	13.1	13.1	4.3	4.3	4.3	4.3
	Corr rate	0.0158	0.0231	0.0085	0.0073	0.0199	0.0247	0.0155	0.0046
12M	Resp rate	0.0160			0.0100	0.0124			0.0057
	Temp	9.0	9.0	9.0	9.0	1.3	1.3	1.3	1.3
	Corr rate	0.0197	0.0308	0.0086	0.0111	0.0266	0.0384	0.0160	0.0112
13S	Resp rate	0.0290			0.0060	0.0151			0.0069
	Temp	6.0	6.0	6.0	6.0	-0.8	-0.8	-0.8	-0.8
	Corr rate	0.0441	0.0554	0.0334	0.0110	0.0379	0.0554	0.0226	0.0164
13M	Resp rate	0.0440			0.0070	0.0168			0.0071
	Temp	13.8	13.8	13.8	13.8	4.4	4.4	4.4	4.4
	Corr rate	0.0391	0.0473	0.0308	0.0083	0.0286	0.0402	0.0177	0.0113
13D	Resp rate	0.0570			0.0060	0.0207			0.0082
	Temp	12.7	12.7	12.7	12.7	5.3	5.3	5.3	5.3
	Corr rate	0.0544	0.0611	0.0478	0.0067	0.0331	0.0458	0.0210	0.0124
14D	Resp rate	0.0260			0.0150	0.0176			0.0110
	Temp	12.7	12.7	12.7	12.7	5.3	5.3	5.3	5.3
	Corr rate	0.0248	0.0401	0.0095	0.0153	0.0282	0.0430	0.0138	0.0146
18D	Resp rate	0.0707			0.0177				
	Temp	12.7	12.7	12.7	12.7				
	Corr rate	0.0675	0.0861	0.0490	0.0185				
19S	Resp rate	0.0603			0.0095	0.0161			0.0133
	Temp	6.0	6.0	6.0	6.0	-0.8	-0.8	-0.8	-0.8
	Corr rate	0.0916	0.1121	0.0723	0.0199	0.0404	0.0651	0.0182	0.0234
19D	Resp rate					0.0293			0.0211
	Temp					5.3	5.3	5.3	5.3
	Corr rate					0.0469	0.0744	0.0202	0.0271
24S	Resp rate					0.0083			0.0067
	Temp					-0.8	-0.8	-0.8	-0.8
	Corr rate					0.0208	0.0333	0.0096	0.0119
27M	Resp rate	0.0622			0.0383	0.0234			0.0091
	Temp	10.9	10.9	10.9	10.9	4.1	4.1	4.1	4.1
	Corr rate	0.0672	0.1070	0.0275	0.0397	0.0409	0.0566	0.0260	0.0153
27D	Resp rate	0.0691			0.0390	0.0182			0.0117
	Temp	12.7	12.7	12.7	12.7	5.3	5.3	5.3	5.3
	Corr rate	0.0660	0.1058	0.0262	0.0398	0.0291	0.0448	0.0140	0.0154
34M	Resp rate	0.0778			0.0591	0.0422			0.0062
	Temp	14.1	14.1	14.1	14.1	7.1	7.1	7.1	7.1
	Corr rate	0.0673	0.1291	0.0056	0.0617	0.0595	0.0714	0.0480	0.0117

Arrhenius  
slope  
Mean -5571  
Upper 95% CL -7078  
Lower 95% CL -4064  
St. temp. C 12

Monitoring Point		7/6/94	Upper CL	Lower CL	95% CI	10/13/94	Upper CL	Lower CL	95% CI
4D	Resp rate	0.1387			0.0059				
	Temp	19.9	19.9	19.9	19.9				
	Corr rate	0.0819	0.1003	0.0651	0.0176				
6M	Resp rate	0.0617			0.0260	0.0670			0.0455
	Temp	15.4	15.4	15.4	15.4	15.9	15.9	15.9	15.9
	Corr rate	0.0490	0.0782	0.0200	0.0291	0.0515	0.1008	0.0024	0.0492
9M	Resp rate	0.0156			0.0073				
	Temp	15.8	15.8	15.8	15.8				
	Corr rate	0.0121	0.0202	0.0040	0.0081				
12M	Resp rate	0.0290			0.0102				
	Temp	20.9	20.9	20.9	20.9				
	Corr rate	0.0160	0.0290	0.0035	0.0128				
13S	Resp rate	0.0536			0.0410				
	Temp	24.0	24.0	24.0	24.0				
	Corr rate	0.0244	0.0712	-0.0213	0.0462				
13M	Resp rate	0.0810			0.0518				
	Temp	21.3	21.3	21.3	21.3				
	Corr rate	0.0437	0.1034	-0.0148	0.0591				
13D	Resp rate	0.1012			0.0451				
	Temp	15.0	15.0	15.0	15.0				
	Corr rate	0.0828	0.1325	0.0334	0.0496				
14D	Resp rate	0.0399			0.0388				
	Temp	15.0	15.0	15.0	15.0				
	Corr rate	0.0327	0.0733	-0.0079	0.0406				
18D	Resp rate	0.1042			0.0452				
	Temp	15.0	15.0	15.0	15.0				
	Corr rate	0.0853	0.1352	0.0356	0.0498				
19S	Resp rate	0.0651			0.0098				
	Temp	24.0	24.0	24.0	24.0				
	Corr rate	0.0297	0.0465	0.0142	0.0162				
19D	Resp rate	0.0814			0.0135				
	Temp	15.0	15.0	15.0	15.0				
	Corr rate	0.0666	0.0838	0.0496	0.0171				
24S	Resp rate	0.0510			0.0222	0.0450			0.0265
	Temp	24.0	24.0	24.0	24.0	15.8	15.8	15.8	15.8
	Corr rate	0.0232	0.0509	-0.0034	0.0272	0.0348	0.0638	0.0060	0.0289
27M	Resp rate					0.0610			0.0350
	Temp					17.9	17.9	17.9	17.9
	Corr rate					0.0410	0.0807	0.0019	0.0394
27D	Resp rate					0.0870			0.0640
	Temp					17.8	17.8	17.8	17.8
	Corr rate					0.0590	0.1295	-0.0109	0.0702
34M	Resp rate	0.1360			0.0260				
	Temp	19.4	19.4	19.4	19.4				
	Corr rate	0.0829	0.1208	0.0465	0.0371				

Arrhenius  
slope  
Mean -5571  
Upper 95% CL -7078  
Lower 95% CL -4064  
St. temp, C 12

Monitoring Point		3/6/95	Upper CL	Lower CL	95% CI
4D	Resp rate				
	Temp				
	Corr rate				
6M	Resp rate				
	Temp				
	Corr rate				
9M	Resp rate				
	Temp				
	Corr rate				
12M	Resp rate				
	Temp				
	Corr rate				
13S	Resp rate				
	Temp				
	Corr rate				
13M	Resp rate	0.0172			0.0072
	Temp	7.8	7.8	7.8	7.8
	Corr rate	0.0230	0.0321	0.0141	0.0090
13D	Resp rate	0.0194			0.0133
	Temp	7.2	7.2	7.2	7.2
	Corr rate	0.0271	0.0430	0.0115	0.0158
14D	Resp rate				
	Temp				
	Corr rate				
18D	Resp rate	0.0125			0.0086
	Temp	7.2	7.2	7.2	7.2
	Corr rate	0.0175	0.0277	0.0074	0.0102
19S	Resp rate	0.0210			0.0086
	Temp	4.5	4.5	4.5	4.5
	Corr rate	0.0357	0.0499	0.0224	0.0138
19D	Resp rate	0.0293			0.0144
	Temp	7.2	7.2	7.2	7.2
	Corr rate	0.0410	0.0592	0.0230	0.0181
24S	Resp rate				
	Temp				
	Corr rate				
27M	Resp rate				
	Temp				
	Corr rate				
27D	Resp rate				
	Temp				
	Corr rate				
34M	Resp rate				
	Temp				
	Corr rate				

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**APPENDIX 23**  
**TEMPERATURE-CORRECTED RESPIRATION RATES FOR ADDITIONAL MONITORING  
POINTS**



Arrhenius

slope

Mean -5571

Upper 95% CL -7078

Lower 95% CL -4064

St. temp. C 12

Monitoring Point	4/19/93	Upper CL	Lower CL	95% CI	8/16/93	Upper CL	Lower CL	95% CI	11/15/93	Upper CL	Lower CL	95% CI
11D	Resp rate								0.0224	12.7	12.7	0.0142
	Temp											12.7
	Corr rate											0.0145
18D	Resp rate	0.0360		0.026	0.1219			0.0578				0.0177
	Temp	8.4	8.4	8.4	17.8	17.8	17.8	17.8	12.7	12.7	12.7	12.7
	Corr rate	0.0462	0.0755	0.0172	0.0825	0.1495	0.0165	0.0665	0.0214	0.0358	0.0069	0.0145
19M	Resp rate	0.0437		0.012	0.0935			0.0324	0.0707			0.0177
	Temp	9.5	9.5	9.5	20.7	20.7	20.7	20.7	12.7	12.7	12.7	12.7
	Corr rate	0.0520	0.0664	0.0376	0.0524	0.0937	0.0124	0.0406	0.0674	0.0860	0.0488	0.0186
29S	Resp rate	0.0630		0.043	0.0714			0.0499	0.0761			0.0269
	Temp	8.1	8.1	8.1	22.7	22.7	22.7	22.7	12.2	12.2	12.2	12.2
	Corr rate	0.0826	0.1319	0.0338	0.0352	0.0925	-0.0208	0.0567	0.0751	0.1022	0.0479	0.0272
29M	Resp rate	0.0869		0.0273	0.1108			0.1061	0.0592			0.0170
	Temp	10.2	10.2	10.2	22.2	22.2	22.2	22.2	6.0	6.0	6.0	6.0
	Corr rate	0.0984	0.1291	0.0678	0.0564	0.1738	-0.0591	0.0567	0.0901	0.1180	0.0634	0.0273
29D	Resp rate	0.2245		0.14	0.3939			0.2019	0.1844			0.0918
	Temp	8.4	8.4	8.4	17.8	17.8	17.8	17.8	12.2	12.2	12.2	12.2
	Corr rate	0.2883	0.4485	0.1294	0.2667	0.4983	0.0381	0.1165	0.1819	0.2744	0.0894	0.0925
34D	Resp rate	0.0547		0.0138	0.1295			0.0388	0.2218			0.0818
	Temp	8.4	8.4	8.4	17.8	17.8	17.8	17.8	12.7	12.7	12.7	12.7
	Corr rate	0.0702	0.0890	0.0518	0.0875	0.1361	0.0399	0.0481	0.2114	0.2960	0.1269	0.0845
									0.0867			0.0289
									12.7	12.7	12.7	12.7
									0.0828	0.1127	0.0529	0.0299

# Arrhenius

slope

Mean -5571

Upper 95% CL -7078

Lower 95% CL -4064

St. temp, C 12

Monitoring Point	2/12/94	Upper CL	Lower CL	95% CI	7/6/94	Upper CL	Lower CL	95% CI	10/13/94	Upper CL	Lower CL	95% CI
11D	Resp rate	0.1243		0.0457	0.2159			0.0876	0.0670			0.0560
	Temp	5.3	5.3	5.3	15.0	15.0	15.0	15.0	17.8	17.8	17.8	17.8
	Corr rate	0.1990	0.2717	0.1295	0.1761	0.2737	0.0791	0.0973	0.0454	0.1064	-0.0152	0.0608
18D	Resp rate				0.1042			0.0452	0.0670			0.0455
	Temp				15.0	15.0	15.0	15.0	17.8	17.8	17.8	17.8
	Corr rate				0.0850	0.1350	0.0352	0.0499	0.0454	0.0959	-0.0047	0.0503
19M	Resp rate				0.0722			0.0189				
	Temp				18.2	18.2	18.2	18.2				
	Corr rate				0.0476	0.0722	0.0236	0.0243				
29S	Resp rate								0.0840			0.0640
	Temp								15.8	15.8	15.8	15.8
	Corr rate								0.0649	0.1336	-0.0034	0.0685
29M	Resp rate	0.0312		0.0210	0.2110			0.0760	0.0910			0.0385
	Temp	4.9	4.9	4.9	19.9	19.9	19.9	19.9	18.4	18.4	18.4	18.4
	Corr rate	0.0514	0.0798	0.0239	0.1245	0.2196	0.0320	0.0938	0.0592	0.1050	0.0142	0.0454
29D	Resp rate	0.0570		0.0331	0.3280			0.0430	0.1450			0.0560
	Temp	5.3	5.3	5.3	15.0	15.0	15.0	15.0	17.8	17.8	17.8	17.8
	Corr rate	0.0913	0.1367	0.0472	0.2676	0.3257	0.2102	0.0577	0.0982	0.1651	0.0324	0.0664
34D	Resp rate	0.0639		0.0130	0.1670			0.0300				
	Temp	5.3	5.3	5.3	15.0	15.0	15.0	15.0				
	Corr rate	0.1023	0.1292	0.0771	0.1367	0.1743	0.0995	0.0374				

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**APPENDIX 24**

**CALCULATION OF MEAN TEMPERATURE-CORRECTED BACKGROUND SOIL  
RESPIRATION RATES**

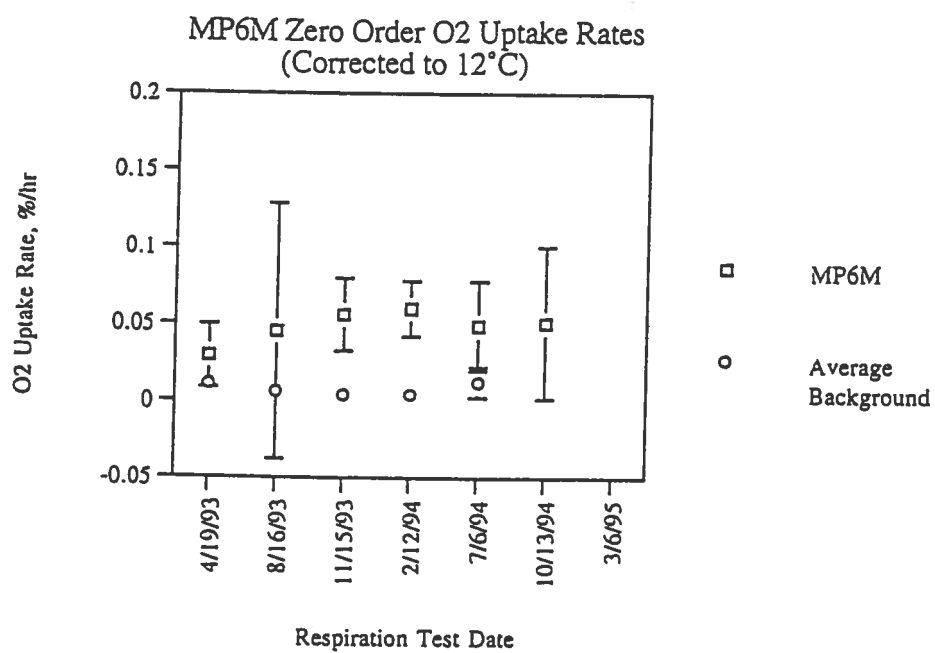
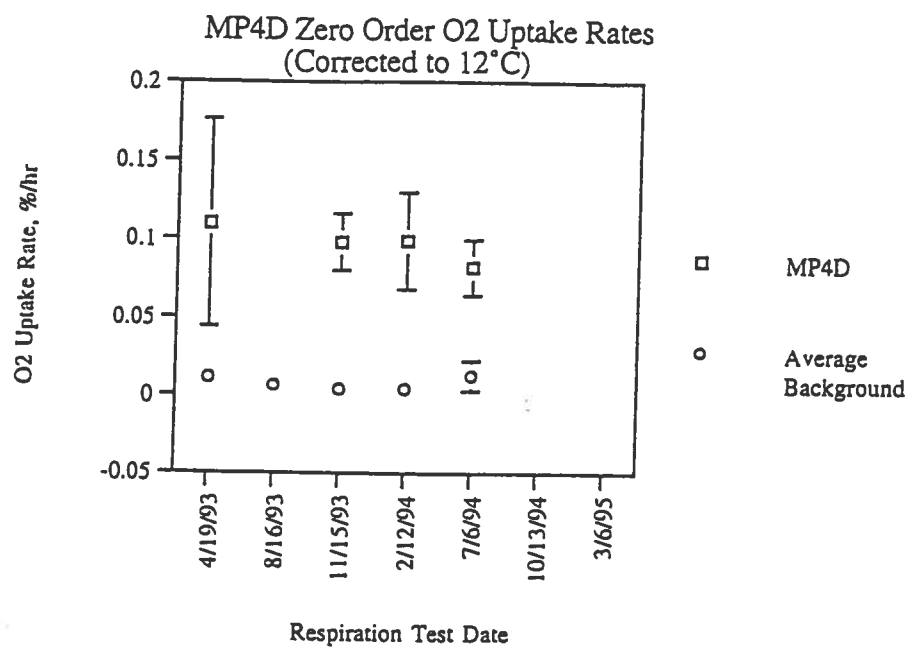
Arrhenius  
slope  
Mean -5571  
Upper 95% CL -7078  
Lower 95% CL -4064  
St. temp. C 12

Monitoring Point		Respiration Test Date						
		4/19/93	8/16/93	11/15/93	2/12/94	7/6/94	10/13/94	3/6/95
20S	Resp rate	0.0059	0.0	0.0	0.0026	0.0114	0.0	0.0
	Temp	8.1			-0.8	24.0		
	Corr rate	0.0077	0.0000	0.0000	0.0065	0.0052		
20M	Resp rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Temp							
	Corr rate	0.0	0.0	0.0	0.0	0.0		
20D	Resp rate	0.0093	0.0094	0.0	0.0078	0.0	0.0	0.0
	Temp	8.4	17.8		5.3			
	Corr rate	0.0119	0.0064	0.0	0.0125	0.0		
21S	Resp rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Temp							
	Corr rate	0.0	0.0	0.0	0.0	0.0		
21M	Resp rate	0.0	0.0053	0.0	0.0	0.0253	0.0	0.0
	Temp		18.4			17.1		
	Corr rate	0.0	0.0035	0.0	0.0	0.0179		
21D	Resp rate	0.0086	0.0089	0.0156	0.0047	0.0533	0.0	0.0
	Temp	8.4	17.8	12.7	5.3	15.0		
	Corr rate	0.0110	0.0060	0.0149	0.0075	0.0435		
22S	Resp rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Temp							
	Corr rate	0.0	0.0	0.0	0.0	0.0		
22M	Resp rate	0.0	0.0180	0.0097	0.0083	0.0	0.0	0.0
	Temp		18.4	11.0	4.1			
	Corr rate	0.0	0.0117	0.0104	0.0145	0.0		
22D	Resp rate	0.0194	0.0023	0.0	0.0083	0.0048	0.0	0.0
	Temp	8.4	17.8		5.3	15.0		
	Corr rate	0.0249	0.0016	0.0		0.0039		
23S	Resp rate	0.0102	0.0141	0.0149	0.0	0.0	0.0	0.0
	Temp	8.1	22.7	6.0				
	Corr rate	0.0134	0.0070	0.0226	0.0	0.0		
23M	Resp rate	0.0255	0.0291	0.0	0.0096	0.0736	0.0	0.0
	Temp	8.5	19.6		3.5	19.1		
	Corr rate	0.0325	0.0175	0.0	0.0175	0.0458		
23D	Resp rate	0.0319	0.0379	0.0	0.0	0.0571	0.0	0.0
	Temp	8.4	17.8			15.0		
	Corr rate	0.0410	0.0257	0.0	0.0	0.0466		
26S	Resp rate	0.0	0.0036	0.0031	0.0	0.0	0.0	0.0
	Temp	8.1	22.7	6.0	-0.8	24.0		
	Corr rate	0.0000	0.0018	0.0047	0.0			
26M	Resp rate	0.0076	0.0066	0.0047	0.0	0.0	0.0	0.0
	Temp	8.9	16.7	10.1				
	Corr rate	0.0094	0.0048	0.0054	0.0			
26D	Resp rate	0.0085	0.0082	0.0	0.0	0.0	0.0	0.0
	Temp	8.4	17.8			15.0		
	Corr rate	0.0109	0.0056	0.0	0.0	0.0		
Mean Corr rate		0.0109	0.0061	0.0039	0.0042	0.0125	0.0	0.0
95% CI		0.0065	0.0037	0.0035	0.0032	0.0098		

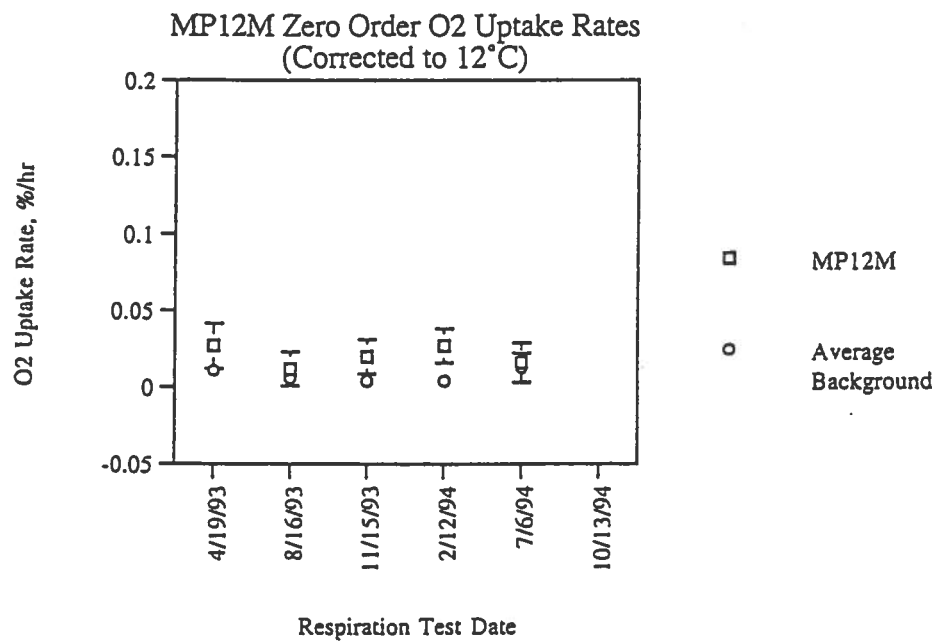
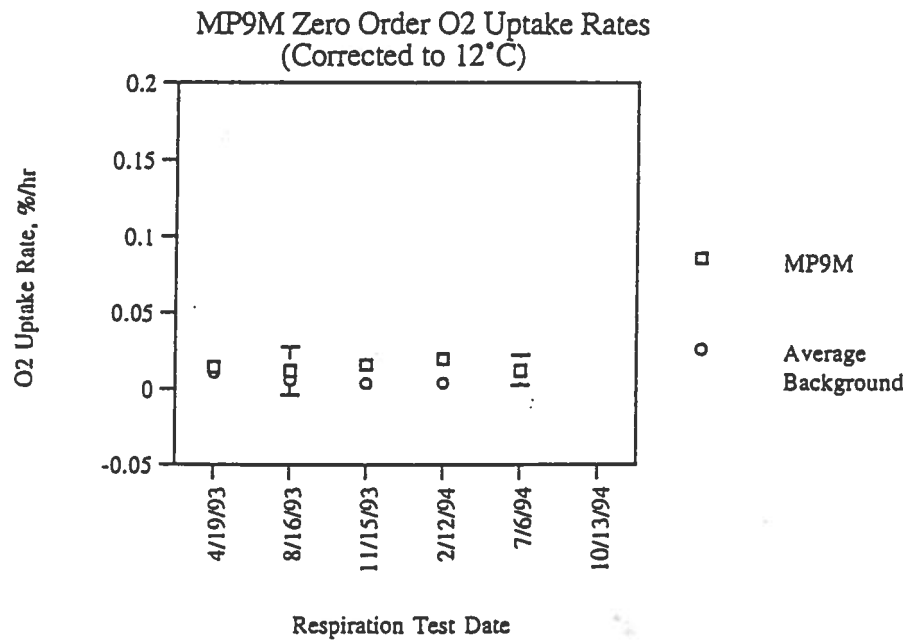
## **APPENDIX 25**

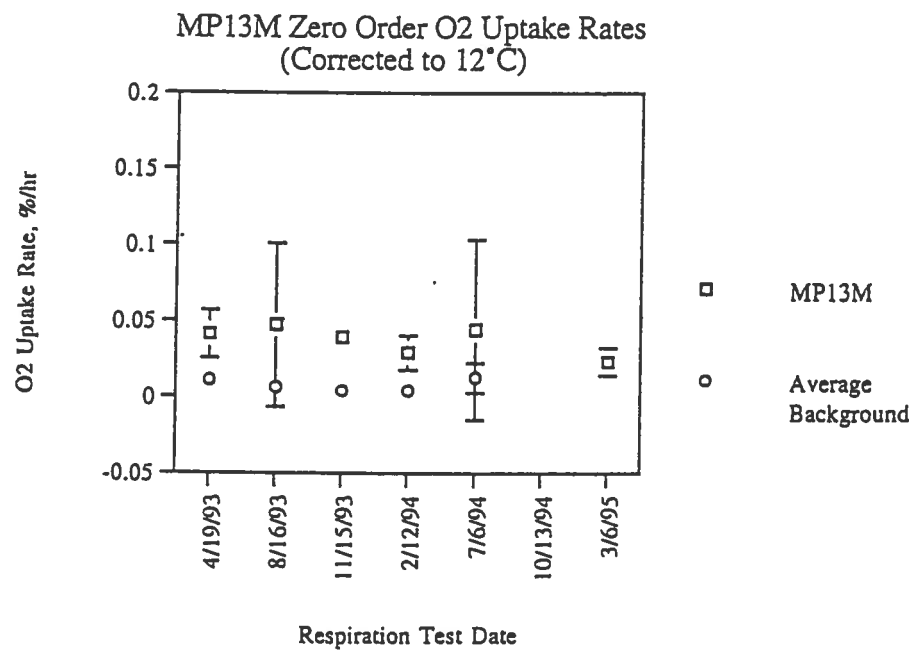
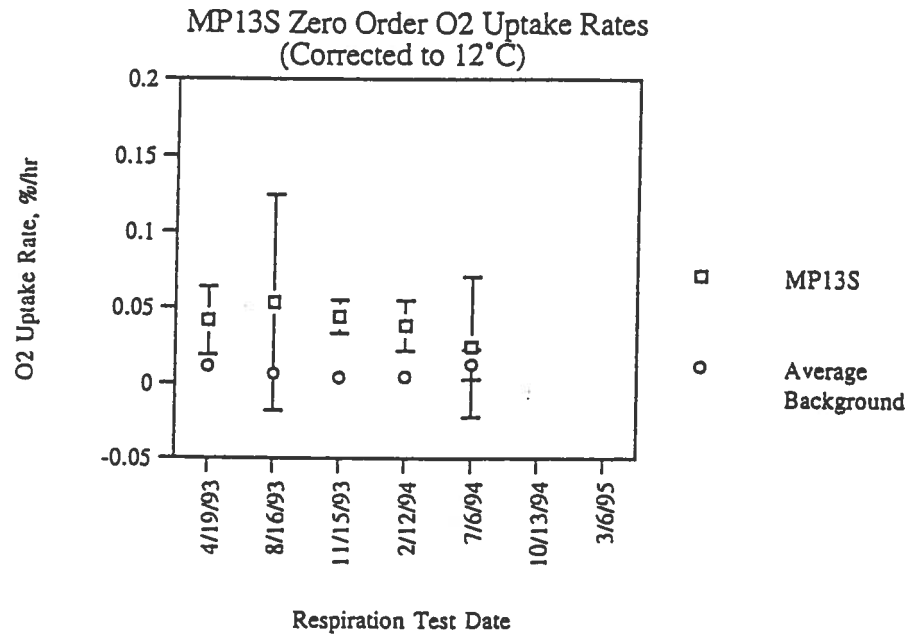
### **TEMPERATURE-CORRECTED RESPIRATION RATE PLOTS FOR MONITORING POINTS USED IN TEMPERATURE-CORRECTION REGRESSION**

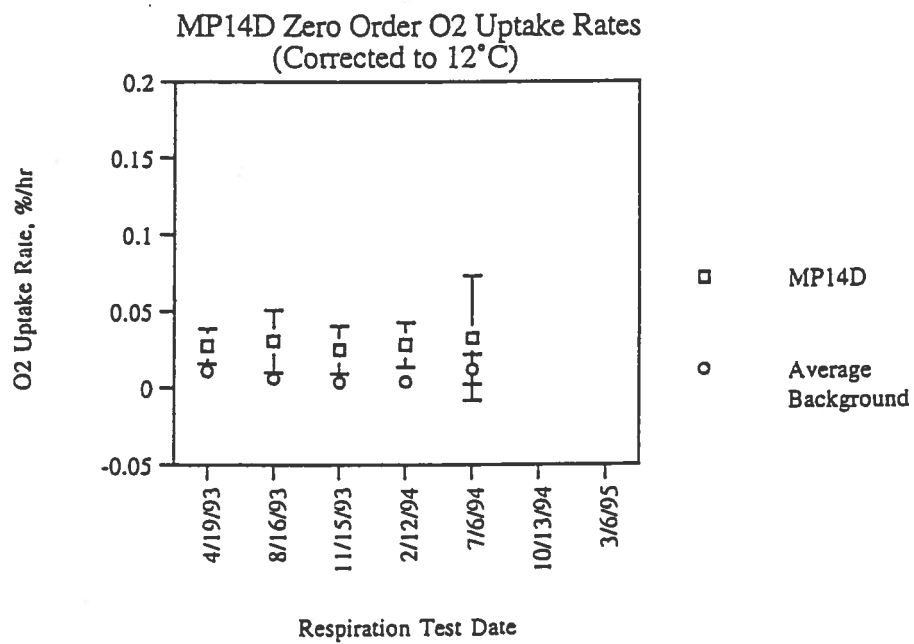
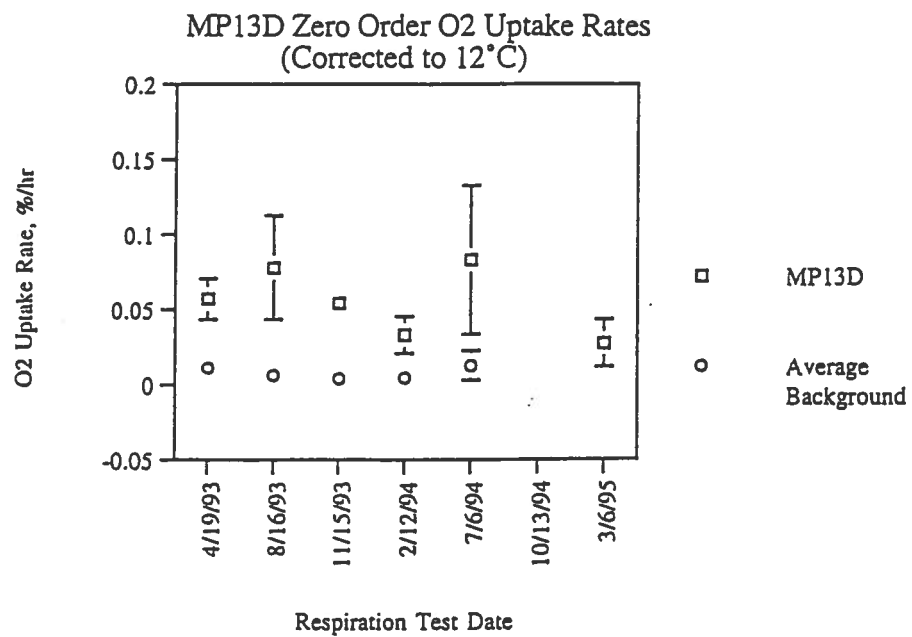
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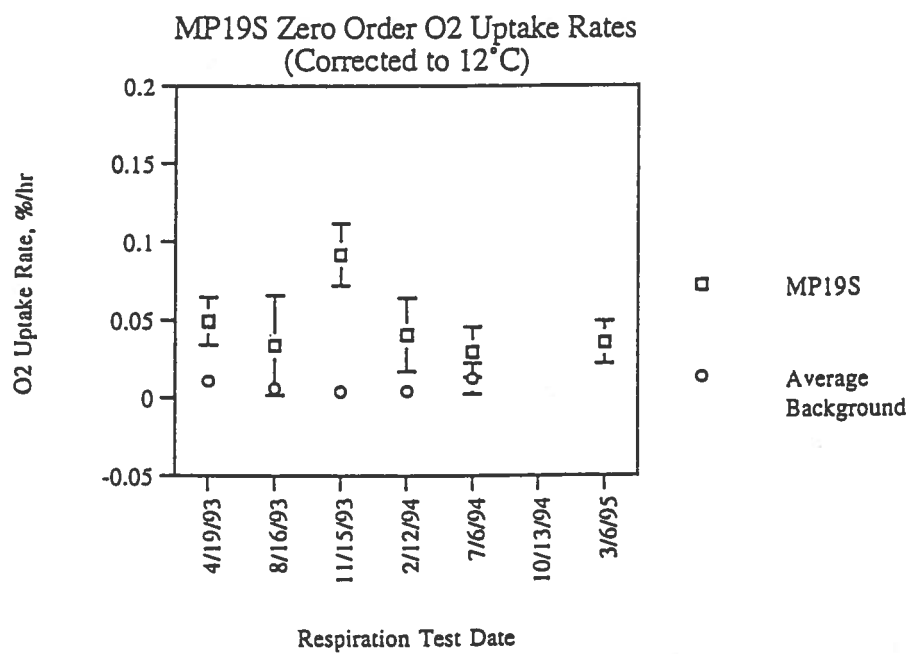
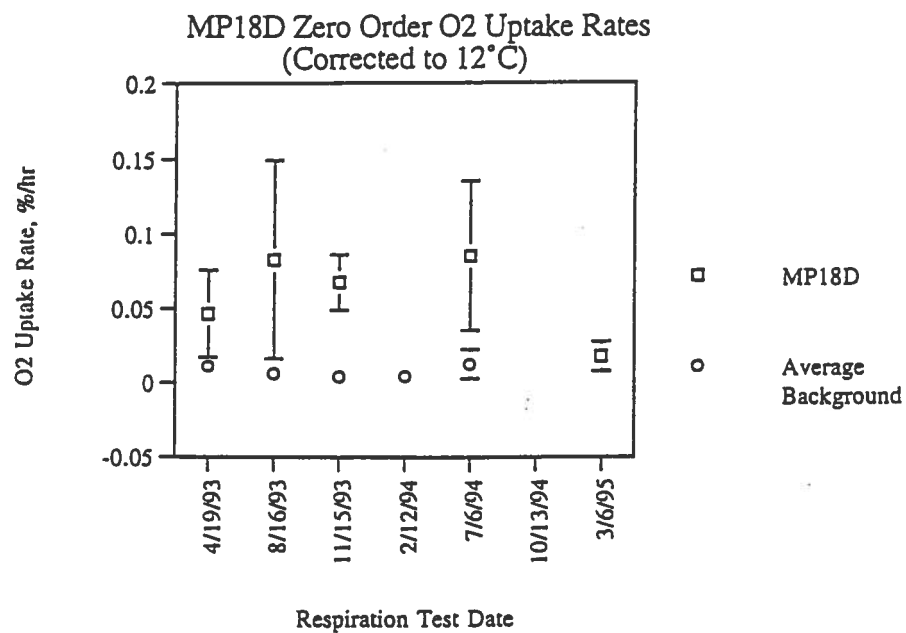


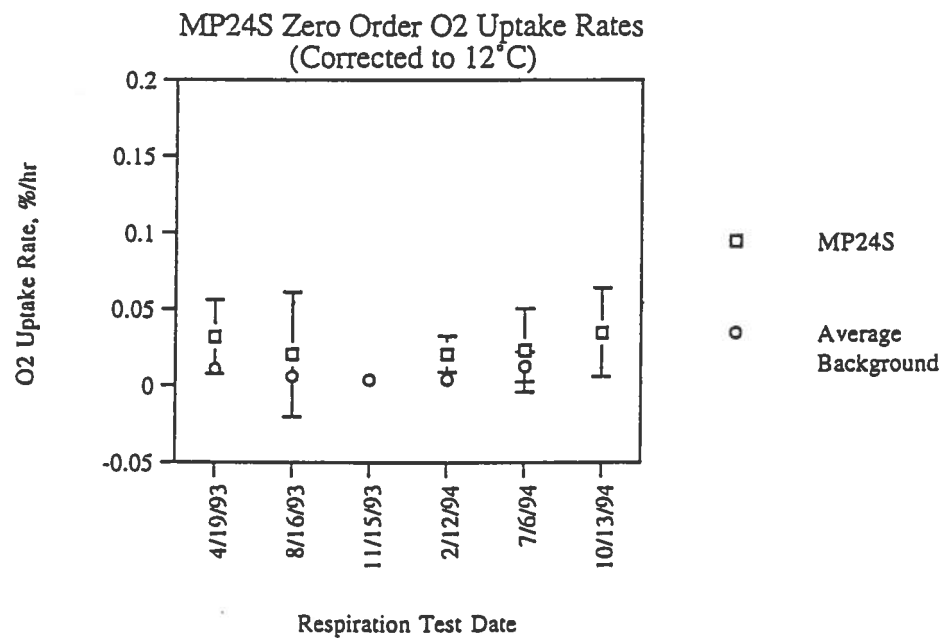
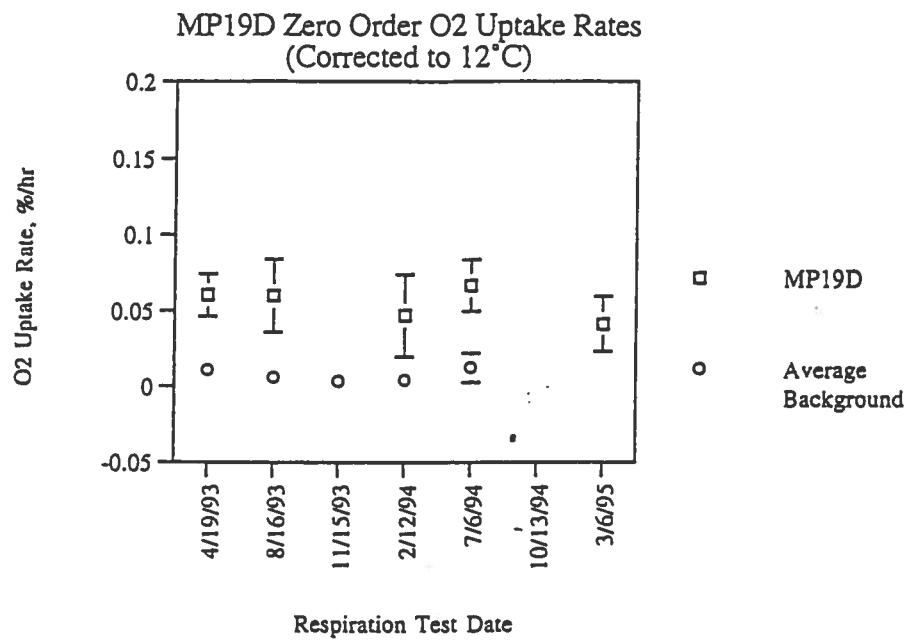


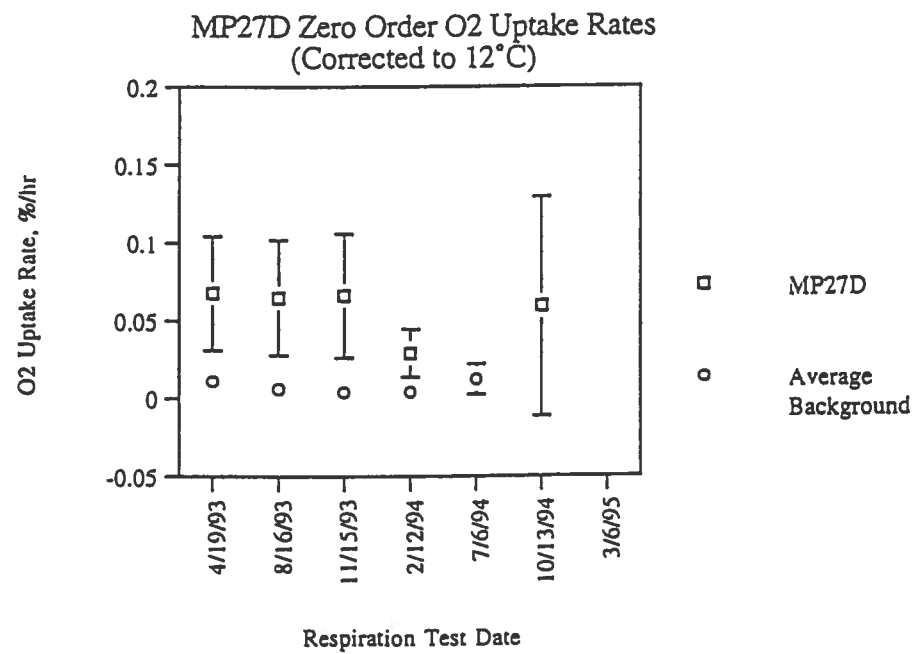
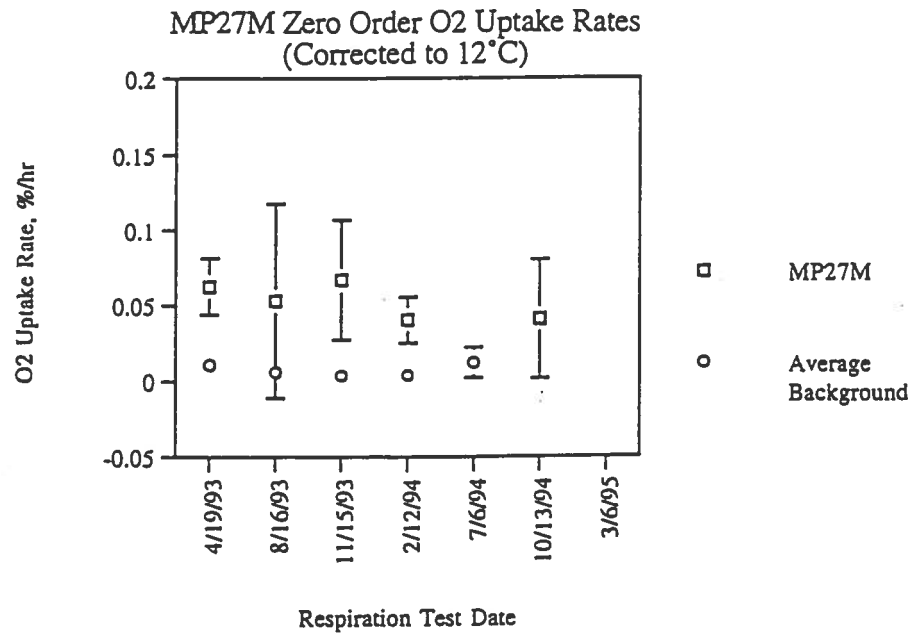


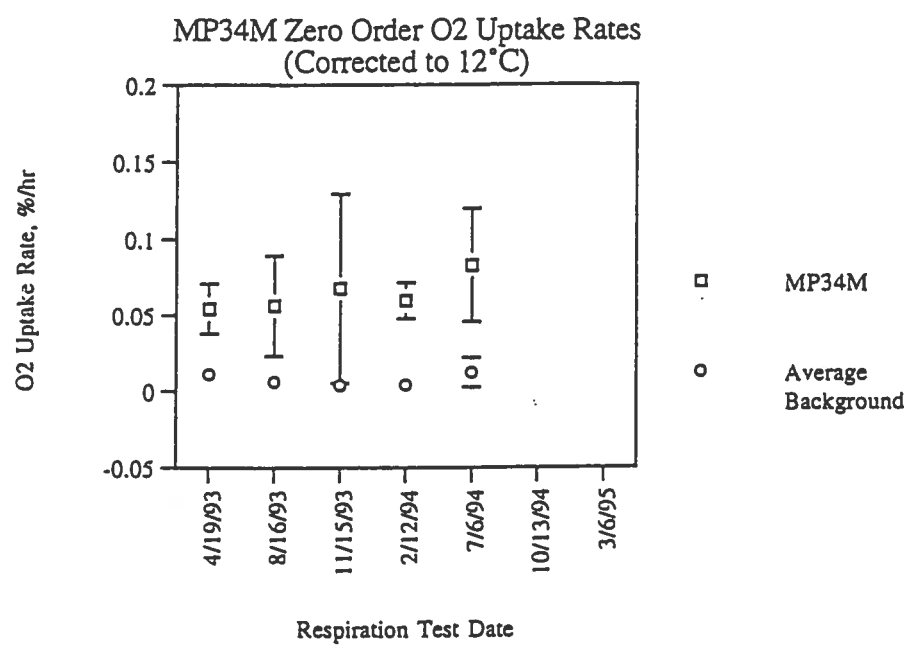










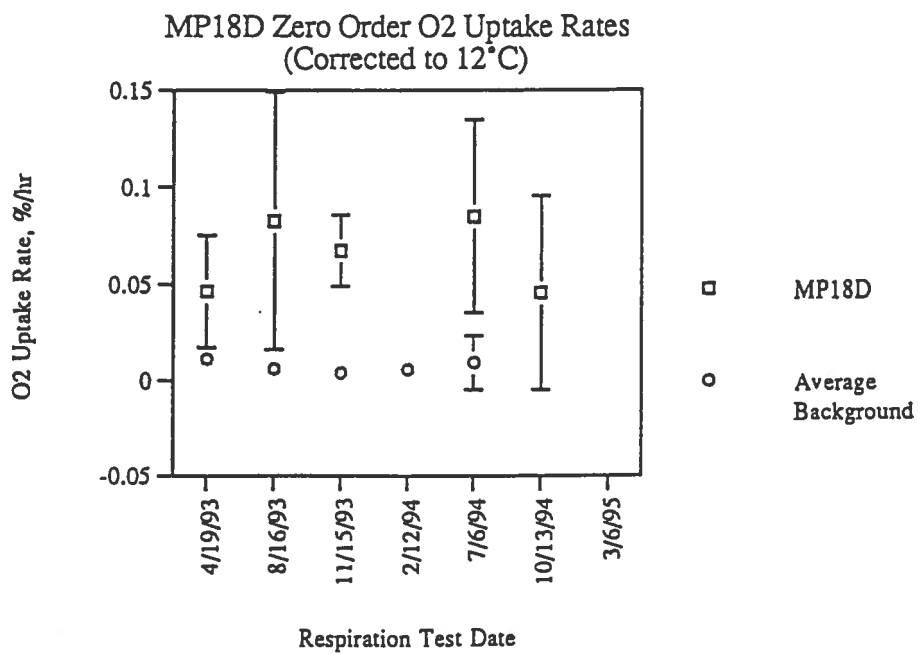
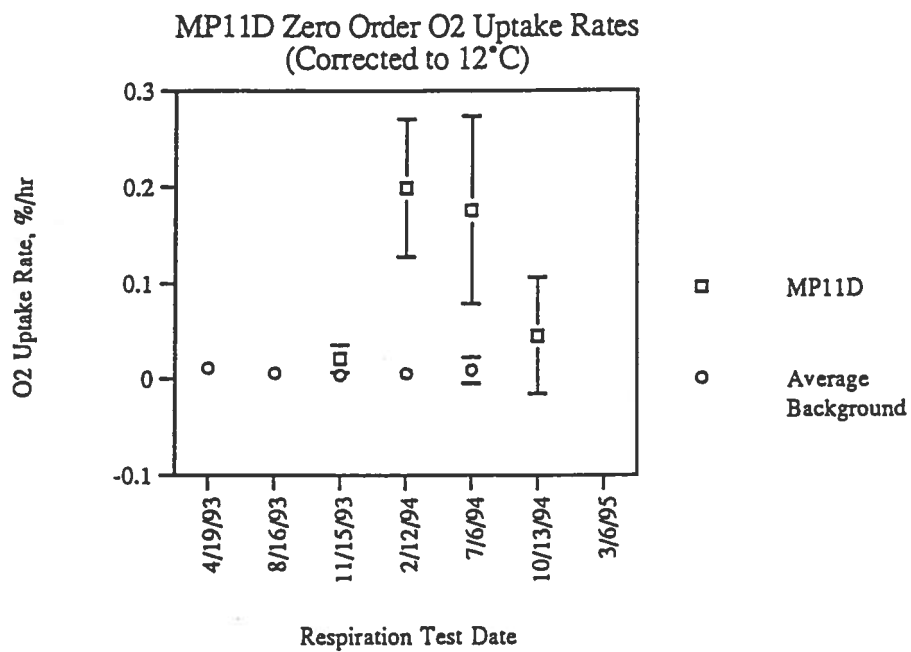


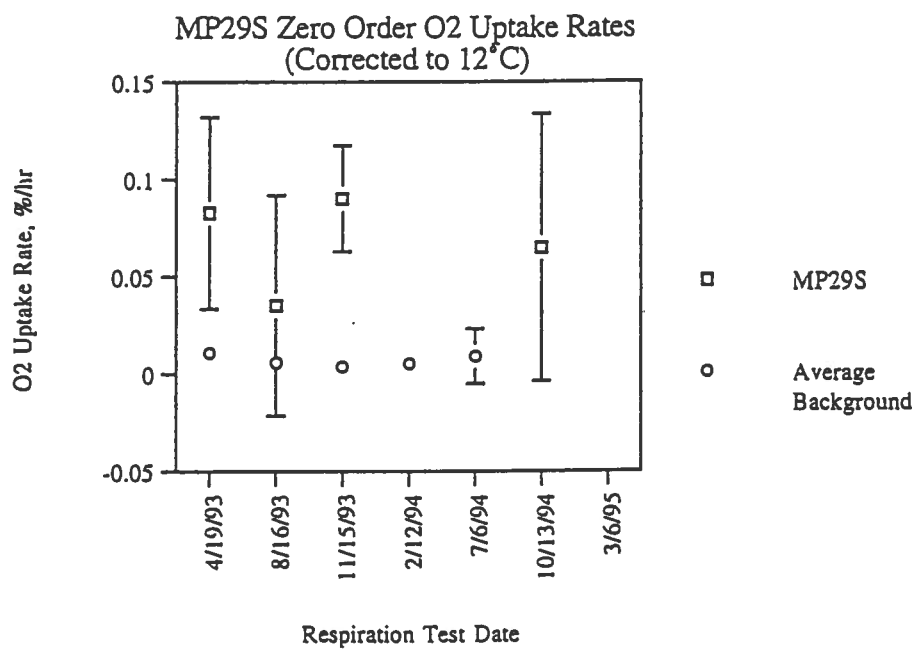
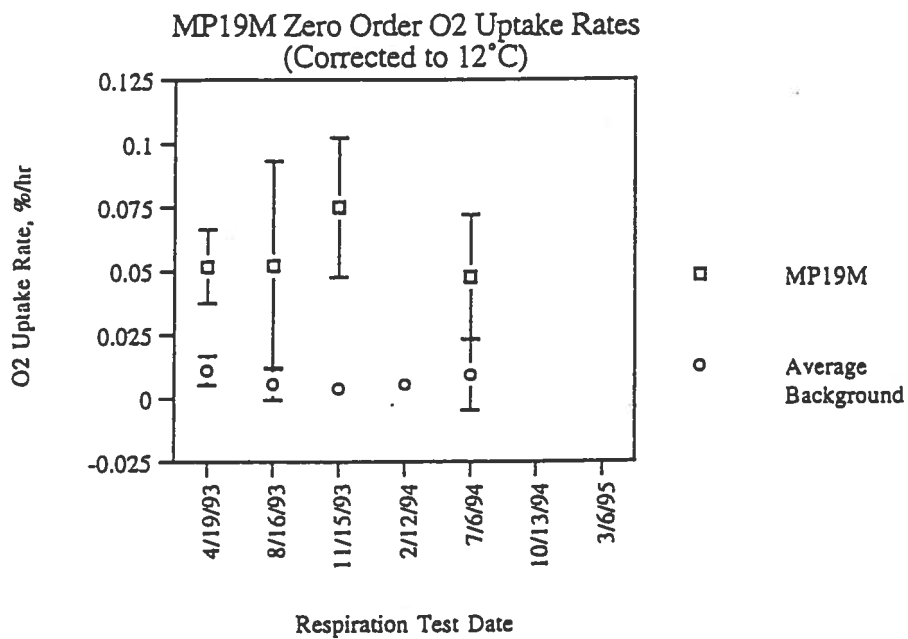
**APPENDIX 26**

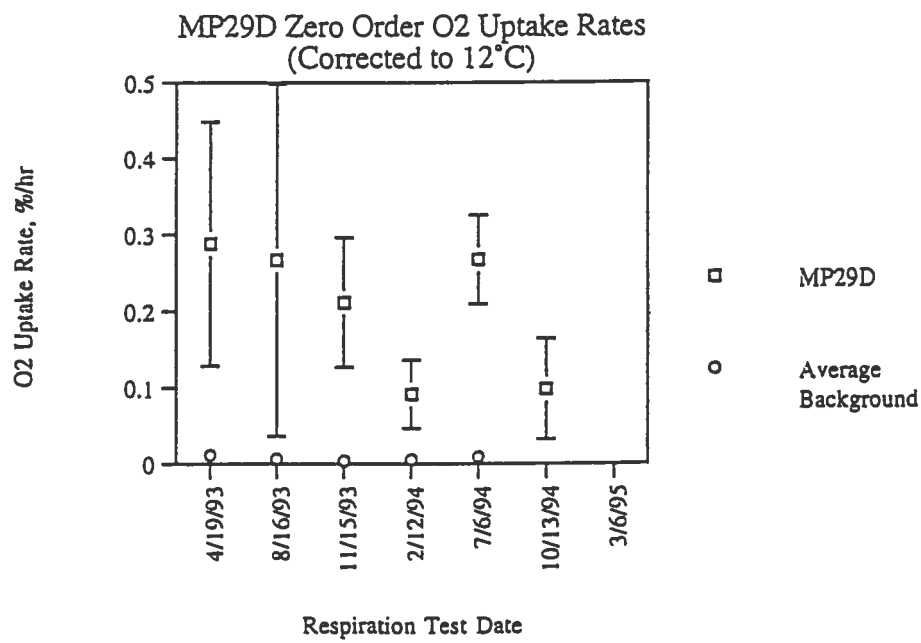
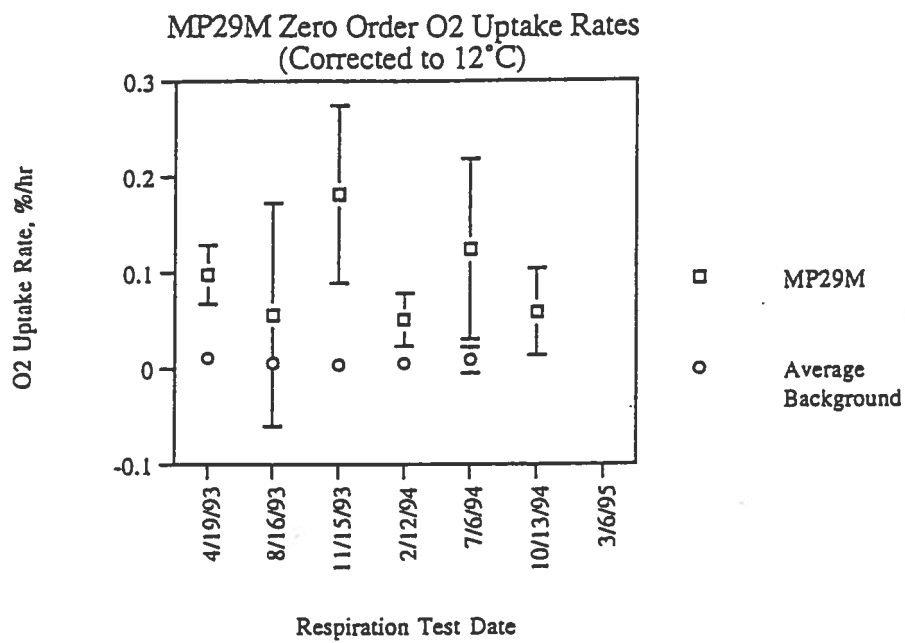
**TEMPERATURE-CORRECTED RESPIRATION RATE PLOTS FOR ADDITIONAL  
MONITORING POINTS**

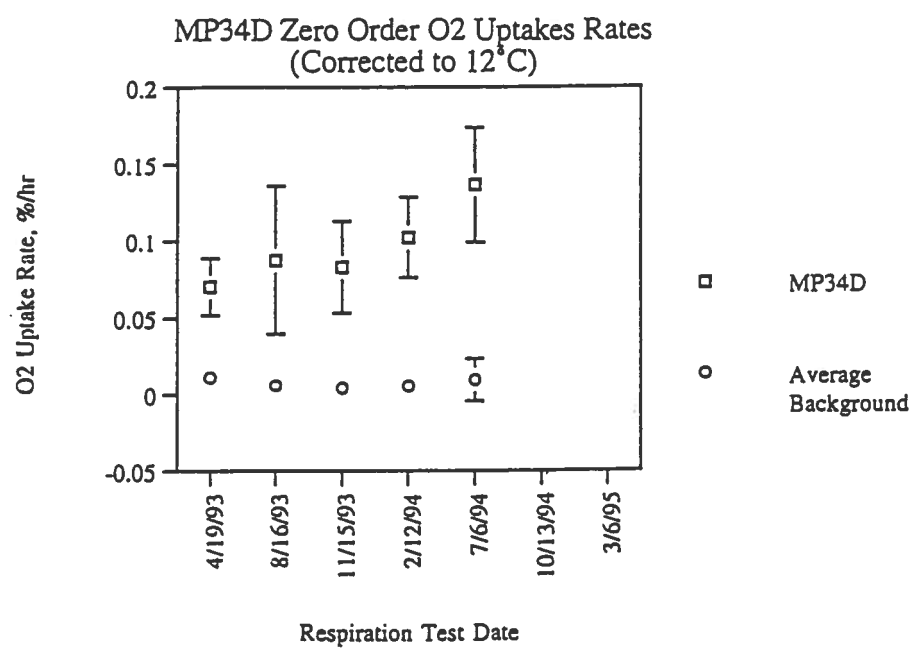


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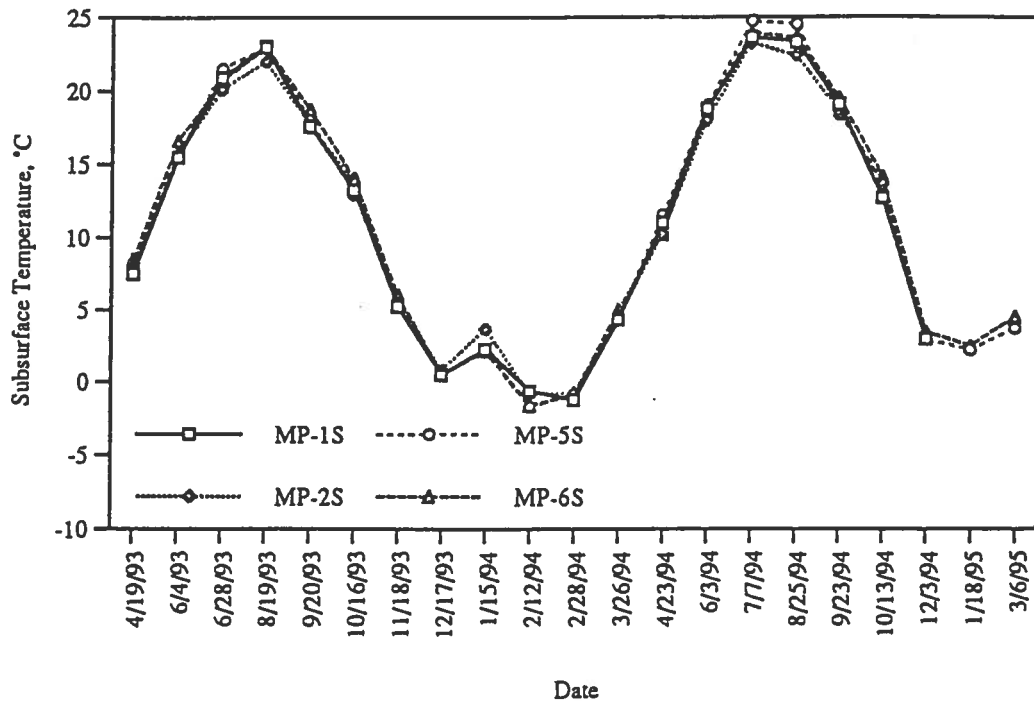


## **APPENDIX 27**

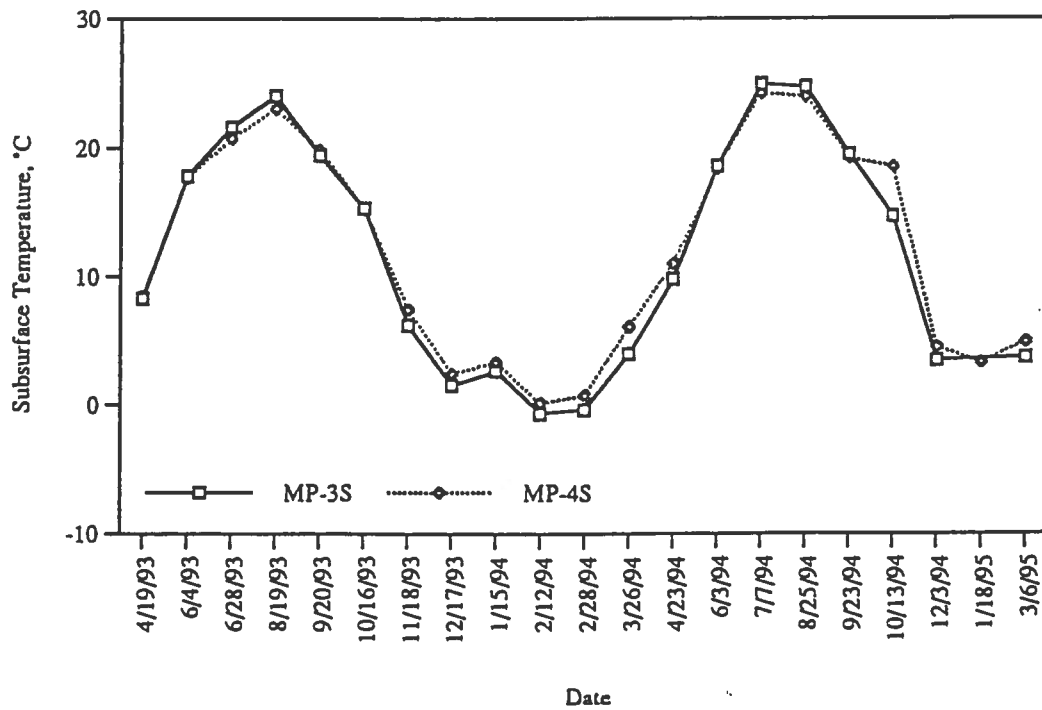
### **PLOTS OF TEMPERATURE DATA TO VERIFY DEPTHS OF MONITORING POINT THERMOCOUPLES IN VICINITY OF THE PLASTIC-COVERED AREA**

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Shallow Monitoring Point (Outside Covered Area) Subsurface Temperatures

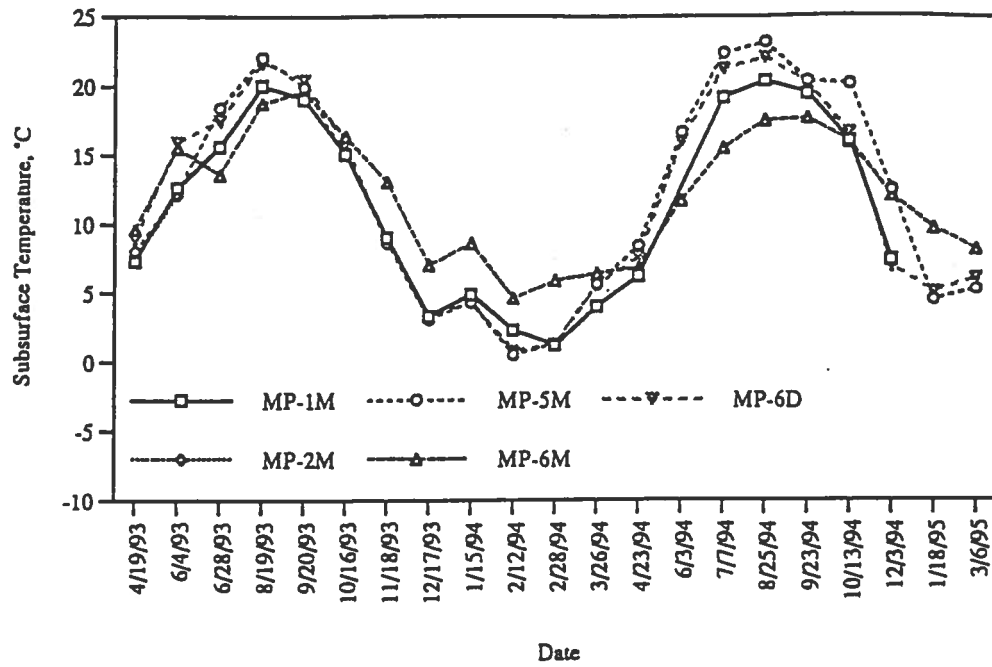


Shallow Monitoring Point (Inside Covered Area) Subsurface Temperatures

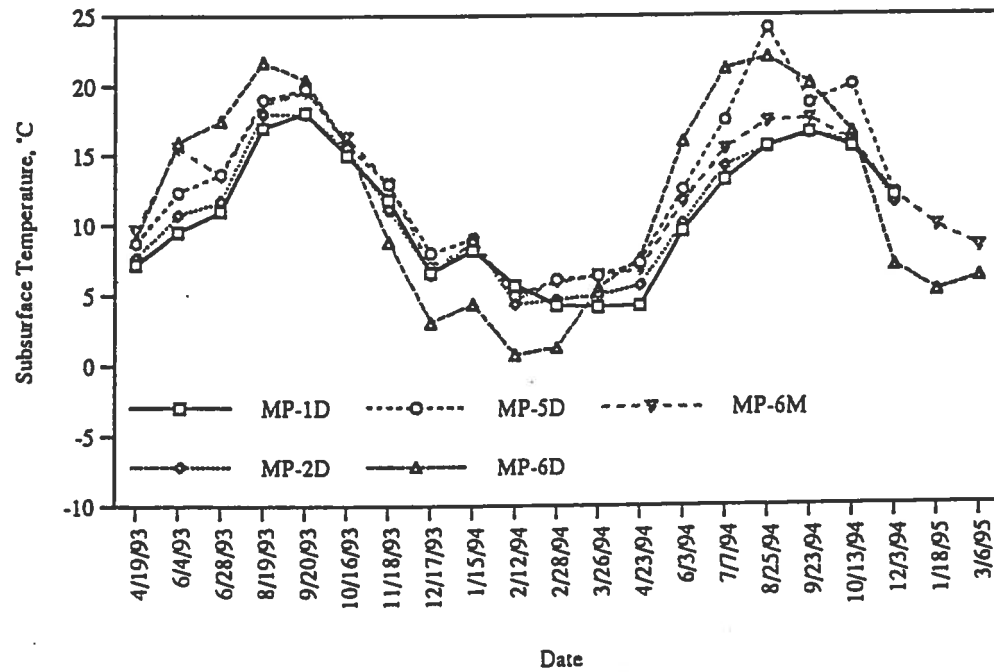




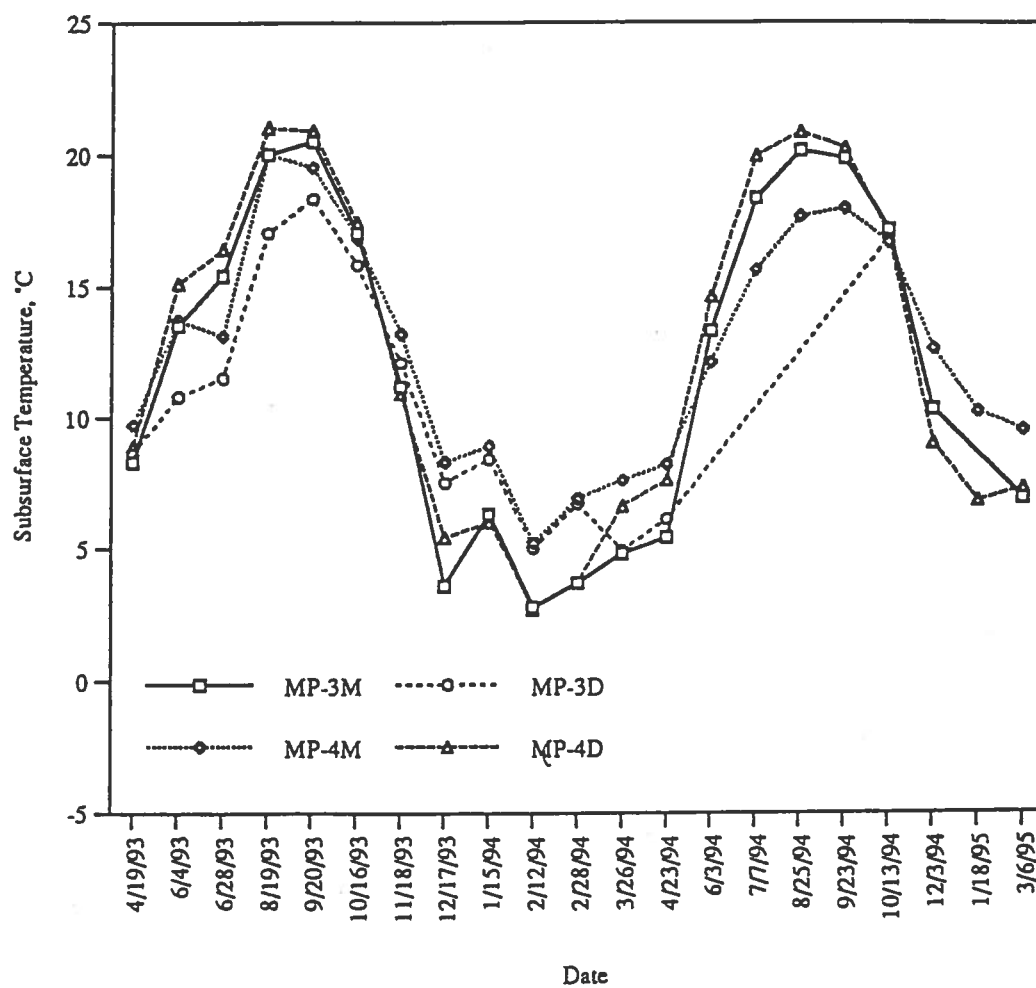
Medium Monitoring Point (Outside Covered Area) Subsurface Temperatures



Deep Monitoring Point (Outside Covered Area) Subsurface Temperatures



# Medium and Deep Monitoring Point (Inside Covered Area) Subsurface Temperatures

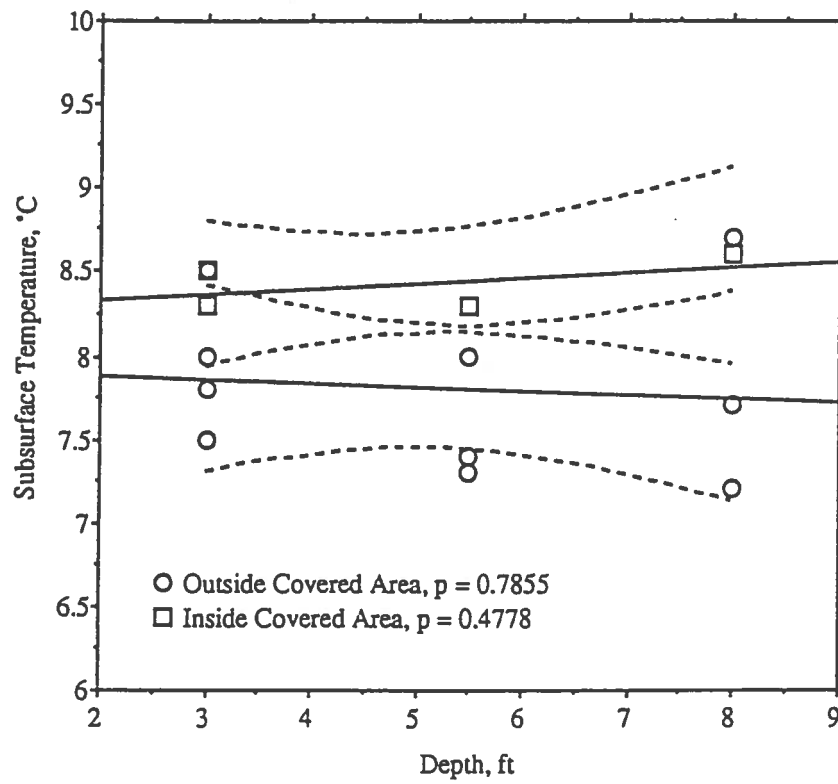


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**APPENDIX 28**

**RESULTS OF STATISTICAL ANALYSES OF MONITORING POINT AND SOIL  
THERMOCOUPLE TEMPERATURE DATA**

April 1993  
Cover in Place



# April 1993 Inside Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	.048	.024	1.187
Within groups	1	.02	.02	p = .5443
Total	3	.068		

Model II estimate of between component variance = .003

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	8.4	.141	.1
M MP	1	8.3	.	.
D MP	1	8.6	.	.

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	.1	2.201	.167	.577
S MP vs. D MP	-.2	2.201	.667	1.155
M MP vs. D MP	-.3	2.541	1.125	1.5

# April 1993 Outside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	2	.266	.133	.469
Within groups	7	1.983	.283	p = .6441
Total	9	2.249		

Model II estimate of between component variance = -.046

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	7.95	.42	.21
M MP	3	7.567	.379	.219
D MP	3	7.867	.764	.441

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
S MP vs. M MP	.383	.961	.445	.943
S MP vs. D MP	.083	.961	.021	.205
M MP vs. D MP	-.3	1.028	.238	.69

# April 11, 2013 ANOVA, All MPs Inside vs All MPs Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	1.081	1.081	5.598
Within groups	12	2.317	.193	p = .0357
Total	13	3.397		

Model II estimate of between component variance = .155

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	10	7.81	.5	.158
Inside	4	8.425	.15	.075

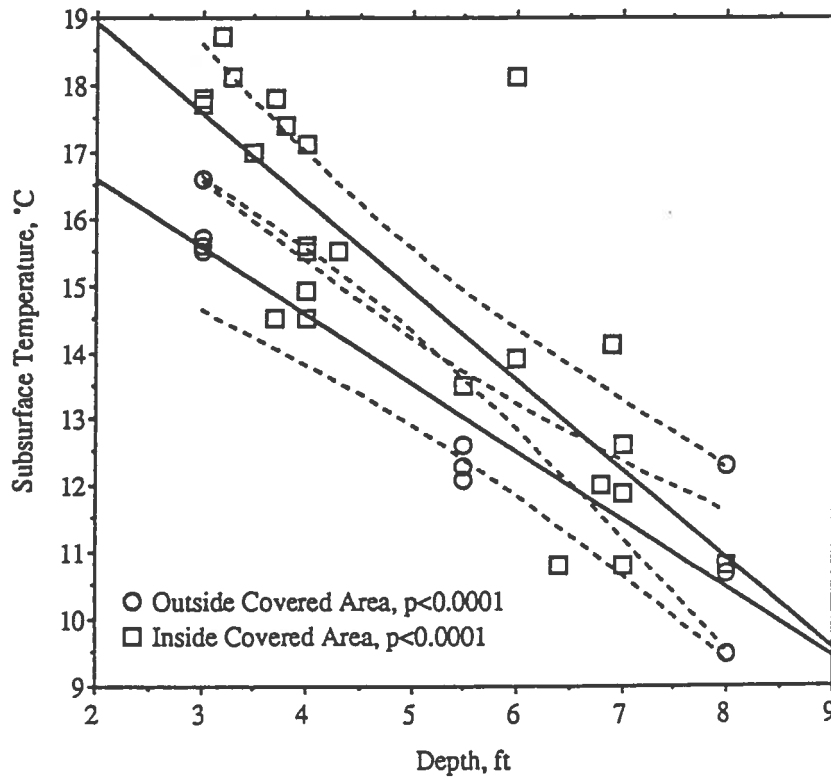
One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-.615	.566 *	5.598*	2.366

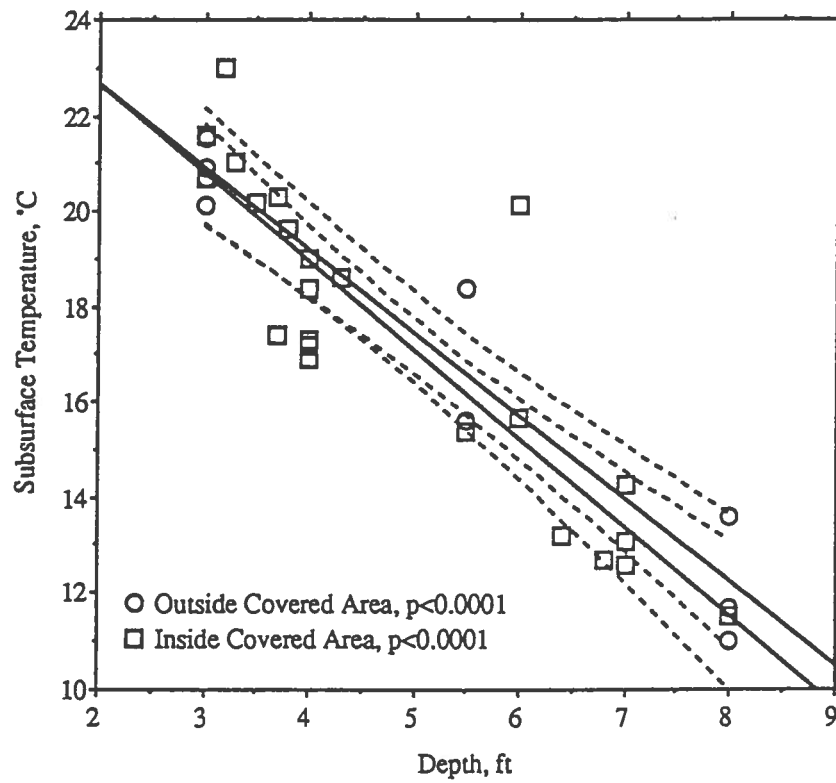
\* Significant at 95%



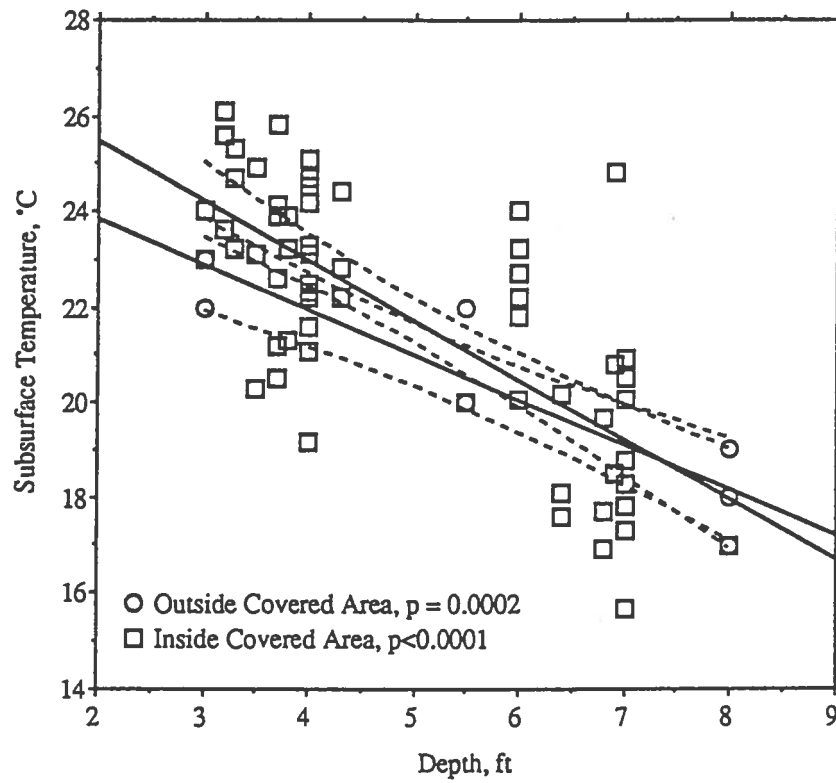
Early June 1993  
Cover in Place



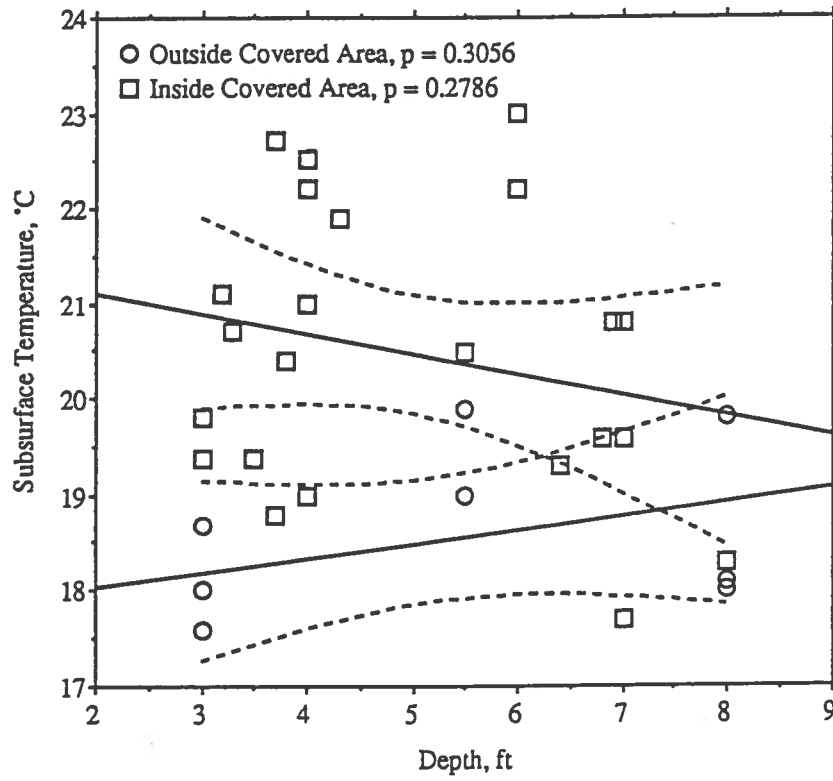
Late June 1993  
Cover in Place



August 1993  
Cover in Place



September 1993  
Cover in Place



# September 1993 Inside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	4	8.161	2.04	.935
Within groups	18	39.271	2.182	p = .4659
Total	22	47.432		

Model II estimate of between component variance = -.039

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	19.6	.283	.2
M MP	1	20.5	.	.
D MP	1	18.3	.	.
S TC	11	20.882	1.382	.417
D TC	8	20.375	1.694	.599

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-.9	3.801	.062	.498
S MP vs. D MP	1.3	3.801	.129	.719
S MP vs. S TC	-1.282	2.385	.319	1.129
S MP vs. D TC	-.775	2.453	.11	.664
M MP vs. D MP	2.2	4.389	.277	1.053

# September 1993 Inside Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
M MP vs. S TC	-.382	3.241	.015	.247
M MP vs. D TC	.125	3.291	.002	.08
D MP vs. S TC	-2.582	3.241	.7	1.674
D MP vs. D TC	-2.075	3.291	.439	1.324
S TC vs. D TC	.507	1.442	.136	.738

# September 1993 Outside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	2.956	1.478	2.721
Within groups	6	3.259	.543	p = .1442
Total	8	6.216		

Model II estimate of between component variance = .324

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	17.975	.519	.259
M MP	2	19.45	.636	.45
D MP	3	18.633	1.012	.584

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-1.475	1.562	2.67	2.311
S MP vs. D MP	-.658	1.377	.684	1.17
M MP vs. D MP	.817	1.646	.737	1.214

# September 1993 ANOVA, All Inside vs All Outside

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	24.421	24.421	13.656
Within groups	30	53.648	1.788	p = .0009
Total	31	78.069		

Model II estimate of between component variance = 1.749

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	9	18.522	.881	.294
Inside	23	20.465	1.468	.306

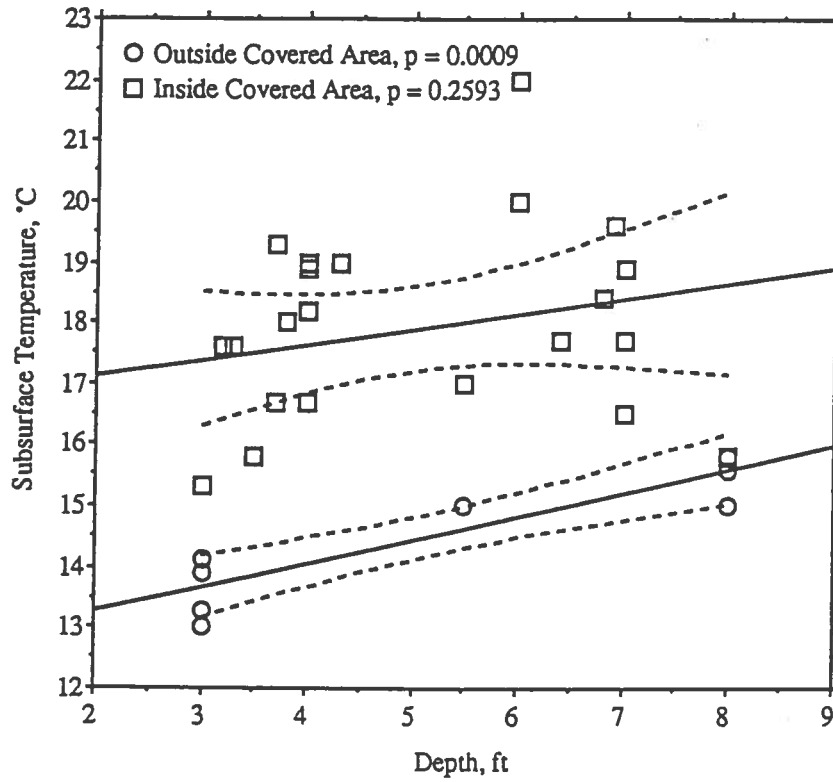
One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	-1.943	1.074*	13.656*	3.695

\* Significant at 95%



October 1993  
Cover in Place



# October 1993 Inside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	4	25.94	6.485	3.523
Within groups	18	33.129	1.841	p = .0272
Total	22	59.069		

Model II estimate of between component variance = 1.264

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	15.3	0	0
M MP	1	17	.	.
D MP	1	15.8	.	.
S TC	11	17.891	1.138	.343
D TC	8	18.85	1.698	.6

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-1.7	3.491	.262	1.023
S MP vs. D MP	-.5	3.491	.023	.301
S MP vs. S TC	-2.591	2.191*	1.543	2.484
S MP vs. D TC	-3.55	2.253*	2.739	3.31
M MP vs. D MP	1.2	4.031	.098	.625

\* Significant at 95%

# October 1993 Inside Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
M MP vs. S TC	-.891	2.977	.099	.629
M MP vs. D TC	-1.85	3.023	.413	1.286
D MP vs. S TC	-2.091	2.977	.544	1.476
D MP vs. D TC	-3.05	3.023*	1.123	2.12
S TC vs. D TC	-.959	1.324	.579	1.521

\* Significant at 95%

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	3	11.477	3.826	1.963
Within groups	17	33.129	1.949	p = .1578
Total	20	44.606		

Model II estimate of between component variance = .465

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
M MP	1	17	.	.
D MP	1	15.8	.	.
S TC	11	17.891	1.138	.343
D TC	8	18.85	1.698	.6

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett z:
M MP vs. D MP	1.2	4.165	.123	.608
M MP vs. S TC	-.891	3.076	.124	.611
M MP vs. D TC	-1.85	3.124	.52	1.249
D MP vs. S TC	-2.091	3.076	.685	1.434
D MP vs. D TC	-3.05	3.124	1.414	2.06

October 1993 AL Except Shallow MP Inside Covered Area ANOVA Results  
 One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
S TC vs. D TC	-.959	1.369	.729	1.479

# October 1993 Outside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	6.721	3.361	17.779
Within groups	6	1.134	.189	p = .003
Total	8	7.856		

Model II estimate of between component variance = 1.098

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	13.575	.512	.256
M MP	2	15	0	0
D MP	3	15.467	.416	.24

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-1.425	.921 *	7.162*	3.785
S MP vs. D MP	-1.892	.813 *	16.226 *	5.697
M MP vs. D MP	-.467	.971	.691	1.176

\* Significant at 95%

# October 1993 Medium and Deep MP Outside Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	1	.261	.261	2.262
Within groups	3	.347	.116	p = .2297
Total	4	.608		

Model II estimate of between component variance = .061

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
M MP	2	15	0	0
D MP	3	15.467	.416	.24

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
M MP vs. D MP	-.467	.988	2.262	1.504

# October 1991 ANOVA, Shallow MPs Inside vs Shallow MPs Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	1	3.968	3.968	20.152
Within groups	4	.787	.197	p = .0109
Total	5	4.755		

Model II estimate of between component variance = 1.414

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	4	13.575	.512	.256
Inside	2	15.3	0	0

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	-1.725	1.067*	20.152*	4.489

\* Significant at 95%



October 1993 ANOVA, All Except Shallow MP Inside vs Medium & Deep MPs Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	32.442	32.442	17.22
Within groups	24	45.214	1.884	p = .0004
Total	25	77.655		

Model II estimate of between component variance = 3.783

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

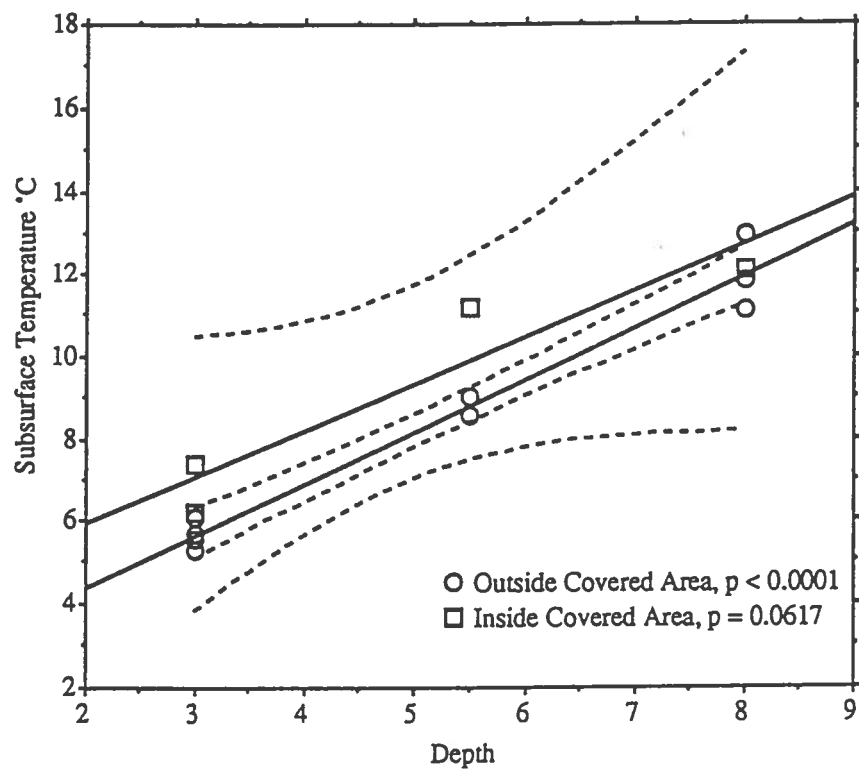
Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	5	15.28	.39	.174
Inside	21	18.114	1.493	.326

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-2.834	1.41 *	17.22*	4.15

\* Significant at 95%

November 1993  
Cover Removed



# November 1993 Inside Covered Area ANOVA results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	23.927	11.964	16.616
Within groups	1	.72	.72	p = .1709
Total	3	24.647		

Model II estimate of between component variance = 8.995

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	6.8	.849	.6
M MP	1	11.2	.	.
D MP	1	12.1	.	.

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-4.4	13.205	8.963	4.234
S MP vs. D MP	-5.3	13.205	13.005	5.1
M MP vs. D MP	-.9	15.247	.281	.75

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	67.448	33.724	98.504
Within groups	6	2.054	.342	p = .0001
Total	8	69.502		

Model II estimate of between component variance = 11.555

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	5.675	.33	.165
M MP	2	8.8	.283	.2
D MP	3	11.933	.907	.524

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-3.125	1.24 *	19.016 *	6.167
S MP vs. D MP	-6.258	1.094 *	98.059 *	14.004
M MP vs. D MP	-3.133	1.307 *	17.206 *	5.866

\* Significant at 95%

# November 1993 ANOVA, All MP Inside vs Slow MP Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	25.205	25.205	6.055
Within groups	6	24.975	4.162	p = .0491
Total	7	50.18		

Model II estimate of between component variance = 5.261

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	4	5.675	.33	.165
Inside	4	9.225	2.866	1.433

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	-3.55	3.53 *	6.055*	2.461

\* Significant at 95%

# November 1993 ANOVA, All MP Inside vs Medium MP Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	.241	.241	.039
Within groups	4	24.727	6.182	p = .8532
Total	5	24.968		

Model II estimate of between component variance = -2.228

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	2	8.8	.283	.2
Inside	4	9.225	2.866	1.433

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-.425	5.978	.039	.197

November 1993 ANOVA, All MP Inside vs All MP Outside

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	12.574	12.574	2.391
Within groups	5	26.294	5.259	p = .1827
Total	6	38.869		

Model II estimate of between component variance = 2.134

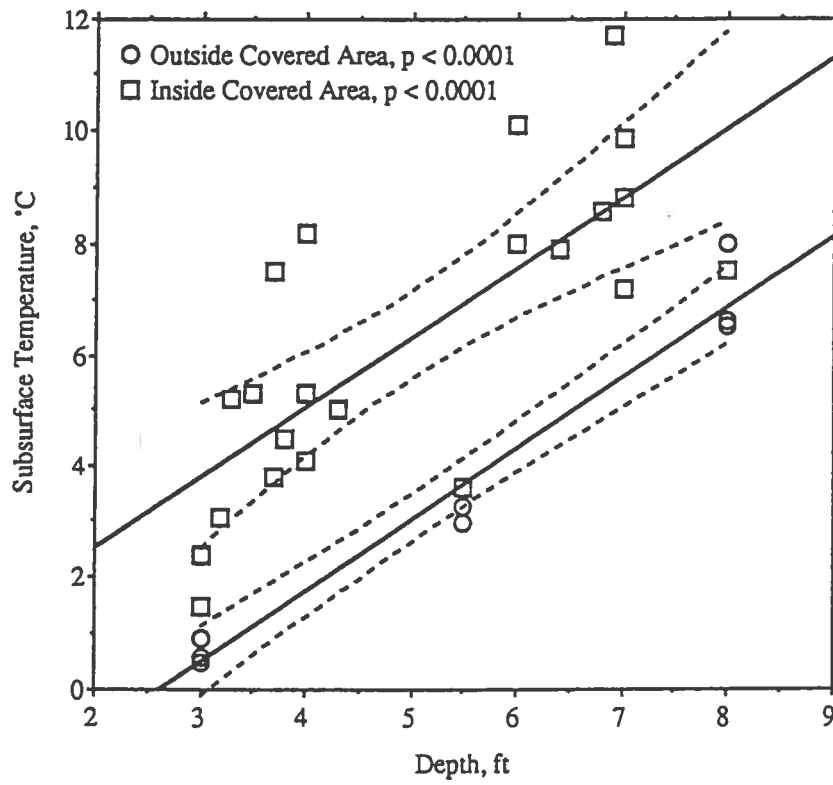
One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	3	11.933	.907	.524
Inside	4	9.225	2.866	1.433

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

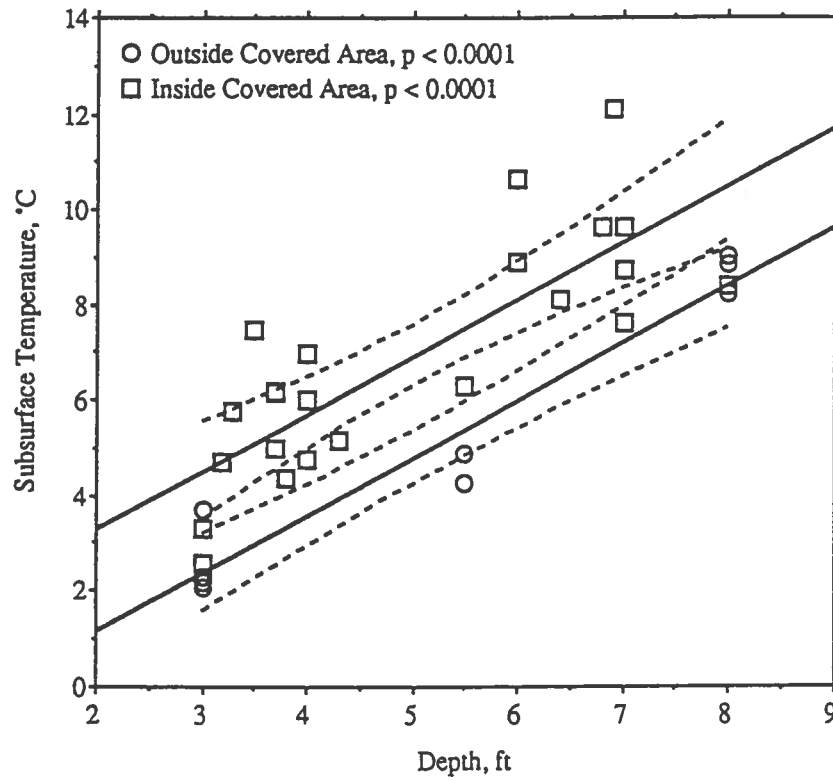
Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	2.708	4.502	2.391	1.546

December 1993  
Cover in Place

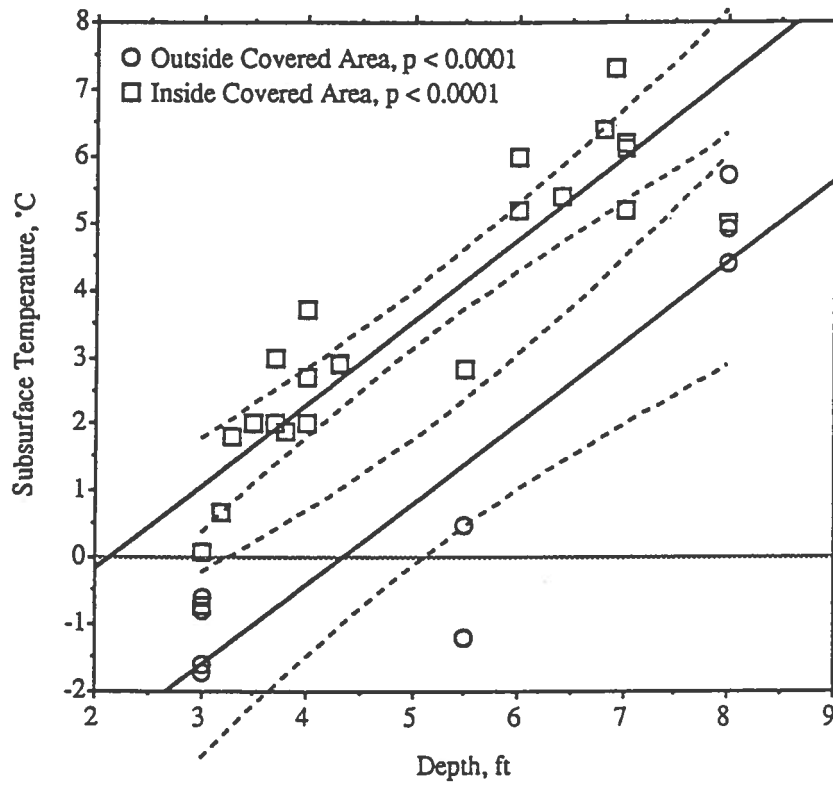




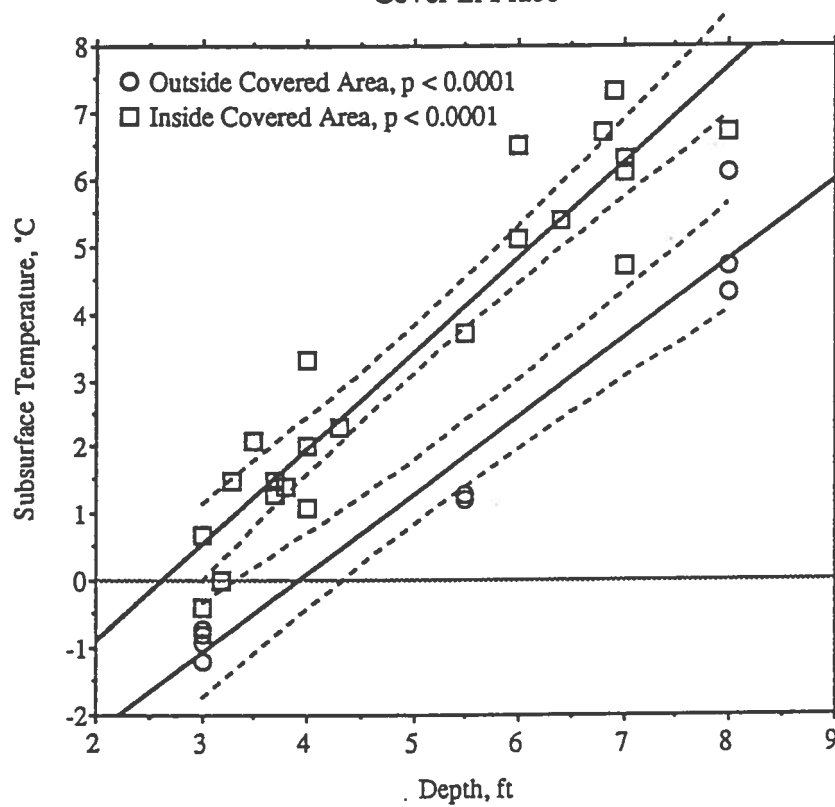
January 1994  
Cover in Place



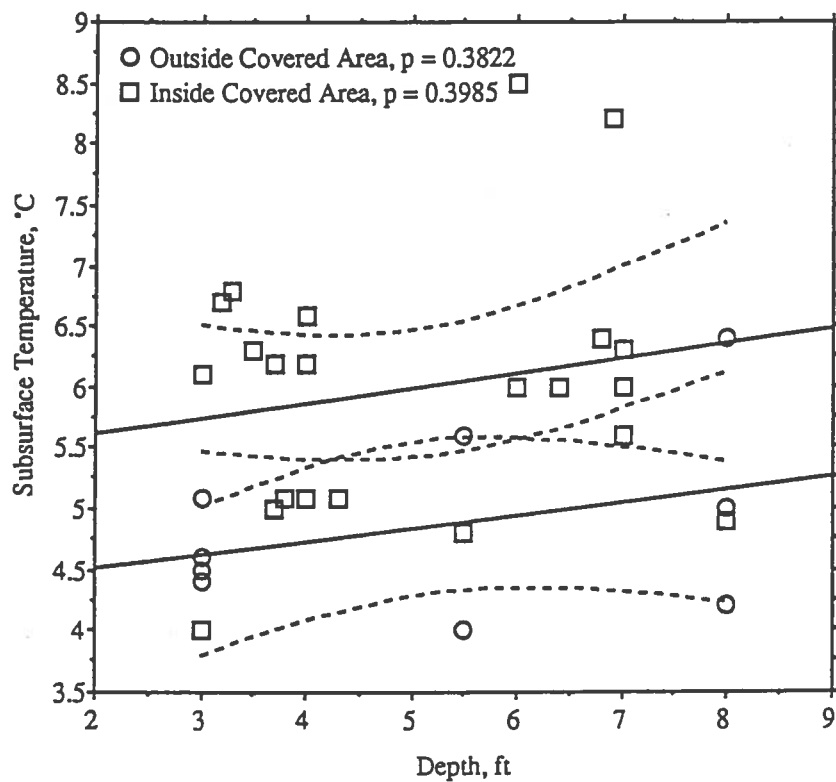
Mid-February 1994  
Cover in Place



Late February 1994  
Cover in Place



March 1994  
Cover in Place



One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	4	7.661	1.915	2.088
Within groups	17	15.589	.917	p = .1271
Total	21	23.25		

Model II estimate of between component variance = .28

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	5.05	1.485	1.05
M MP	1	4.8	.	.
D MP	1	4.9	.	.
S TC	10	5.91	.746	.236
D TC	8	6.625	1.094	.387

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
S MP vs. M MP	.25	2.474	.011	.213
S MP vs. D MP	.15	2.474	.004	.128
S MP vs. S TC	-.86	1.565	.336	1.159
S MP vs. D TC	-1.575	1.597	1.082	2.08
M MP vs. D MP	-.1	2.857	.001	.074

March 1994 Inside Covered Area ANOVA Results  
 One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
M MP vs. S TC	-1.11	2.119	.305	1.105
M MP vs. D TC	-1.825	2.143	.807	1.797
D MP vs. S TC	-1.01	2.119	.253	1.006
D MP vs. D TC	-1.725	2.143	.721	1.698
S TC vs. D TC	-.715	.958	.619	1.574

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	.53	.265	.393
Within groups	6	4.05	.675	p = .6915
Total	8	4.58		

Model II estimate of between component variance = -.142

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	4.65	.311	.155
M MP	2	4.8	1.131	.8
D MP	3	5.2	1.114	.643

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
S MP vs. M MP	-.15	1.741	.022	.211
S MP vs. D MP	-.55	1.535	.384	.877
M MP vs. D MP	-.4	1.835	.142	.533

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	1	8.138	8.138	8.48
Within groups	29	27.83	.96	p = .0068
Total	30	35.968		

Model II estimate of between component variance = .562

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	9	4.867	.757	.252
Inside	22	5.995	1.052	.224

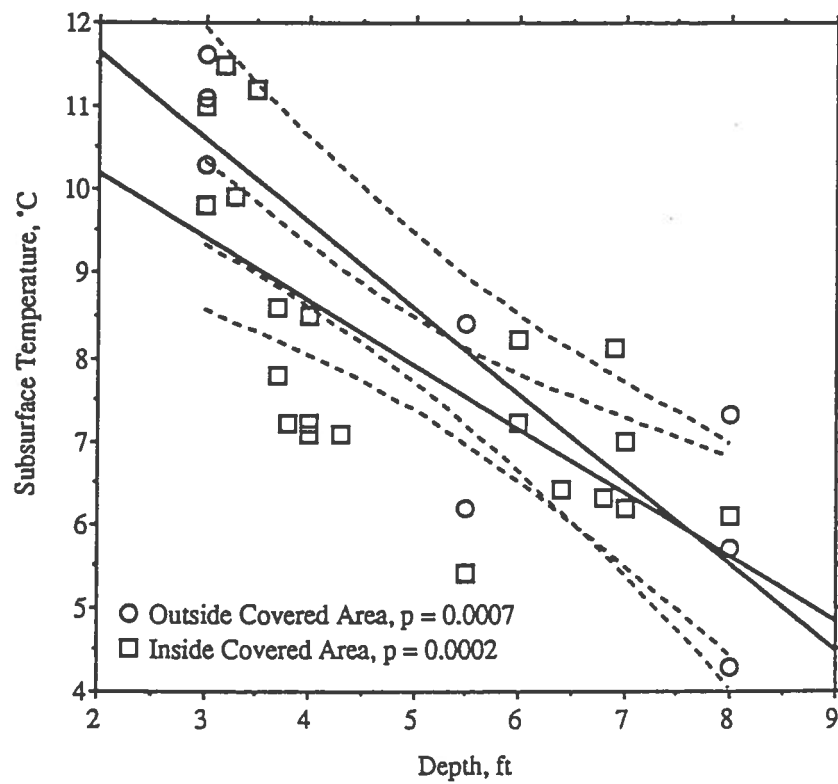
One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-1.129	.793 *	8.48 *	2.912

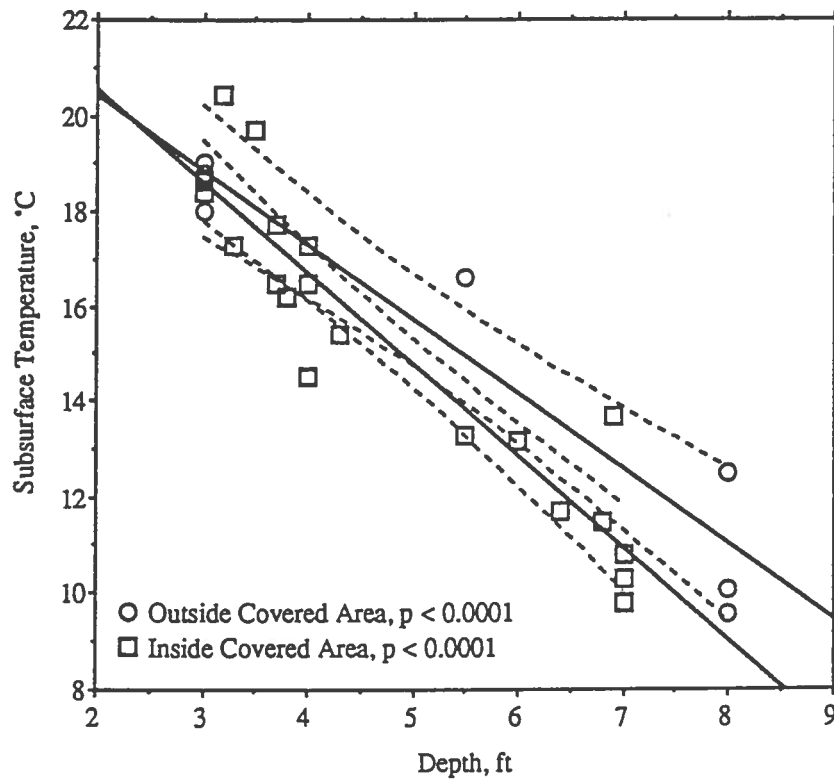
\* Significant at 95%



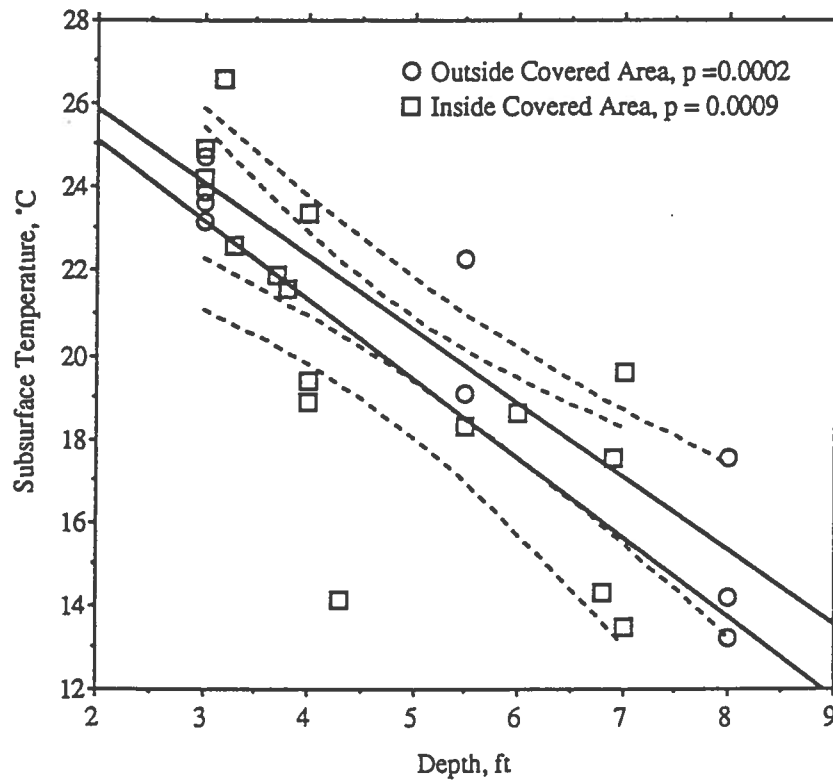
April 1994  
Cover in Place



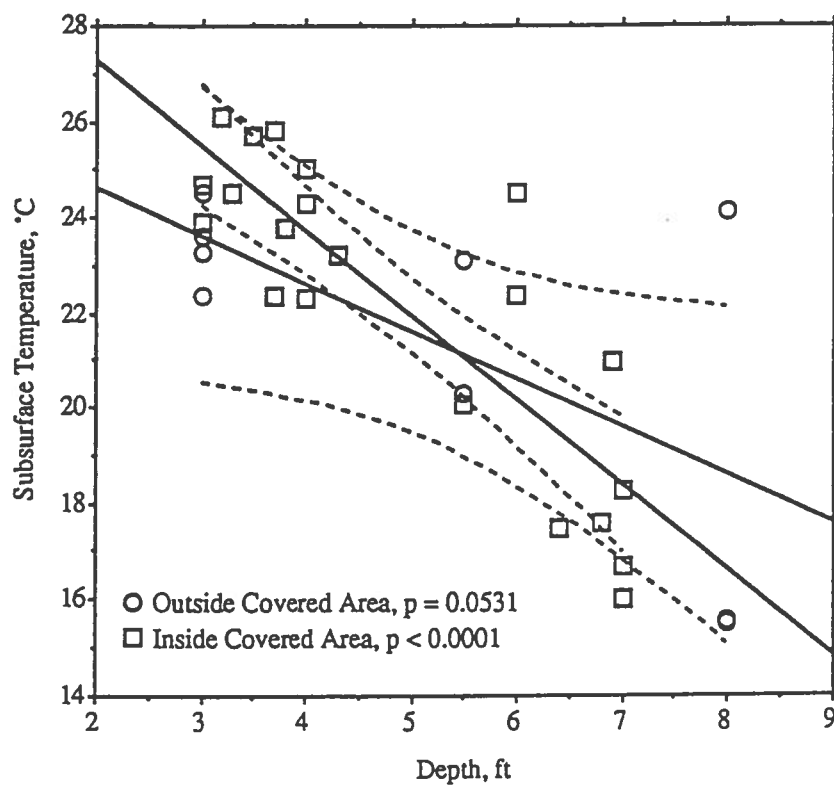
June 1994  
Cover in Place



July 1994  
Cover in Place



August 1994  
Cover Removed



# August 1994 Inside Covered Area ANOVA Results (No Deep MP)

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	3	127.363	42.454	8.837
Within groups	17	81.669	4.804	p = .0009
Total	20	209.032		

Model II estimate of between component variance = 8.72

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	24.3	.566	.4
M MP	1	20.1	.	.
S TC	10	24.31	1.376	.435
D TC	8	19.25	3.031	1.072

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	4.2	5.664	.816	1.565
S MP vs. S TC	-.01	3.582	1.156E-5	.006
S MP vs. D TC	5.05	3.656*	2.831	2.914
M MP vs. S TC	-4.21	4.85	1.118	1.831
M MP vs. D TC	.85	4.905	.045	.366

\* Significant at 95%

# August 1994 Inside Covered Area ANOVA Results (No Deep MP)

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S TC vs. D TC	5.06	2.194*	7.896*	4.867

\* Significant at 95%

# August 4 Shallow MP & TC Inside Covered . a ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	1.667E-4	1.667E-4	9.596E-5
Within groups	10	17.369	1.737	p = .9924
Total	11	17.369		

Model II estimate of between component variance = -.521

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	24.3	.566	.4
S TC	10	24.31	1.376	.435

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. S TC	-.01	2.275	9.596E-5	.01

# August 1994 Medium MP & Deep TC Inside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	.642	.642	.07
Within groups	7	64.3	9.186	p = .7991
Total	8	64.942		

Model II estimate of between component variance = -4.806

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
M MP	1	20.1	.	.
D TC	8	19.25	3.031	1.072

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
M MP vs. D TC	.85	7.601	.07	.264



One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	43.986	21.993	2.403
Within groups	6	54.91	9.152	p = .1712
Total	8	98.896		

Model II estimate of between component variance = 4.445

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	23.45	.866	.433
M MP	2	21.7	1.98	1.4
D MP	3	18.4	4.937	2.85

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	1.75	6.411	.223	.668
S MP vs. D MP	5.05	5.654	2.389	2.186
M MP vs. D MP	3.3	6.757	.714	1.195

# August 1994 ANOVA, Shallow MP & TC Inside vs All MPs Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	44.168	44.168	7.218
Within groups	19	116.265	6.119	p = .0146
Total	20	160.432		

Model II estimate of between component variance = 3.699

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	9	21.378	3.516	1.172
Inside	12	24.308	1.257	.363

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-2.931	2.283*	7.218*	2.687

\* Significant at 95%

# August 1994 ANOVA, Medium MP & Deep TC Inside vs All Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	1	18.605	18.605	1.817
Within groups	16	163.838	10.24	p = .1965
Total	17	182.443		

Model II estimate of between component variance = .929

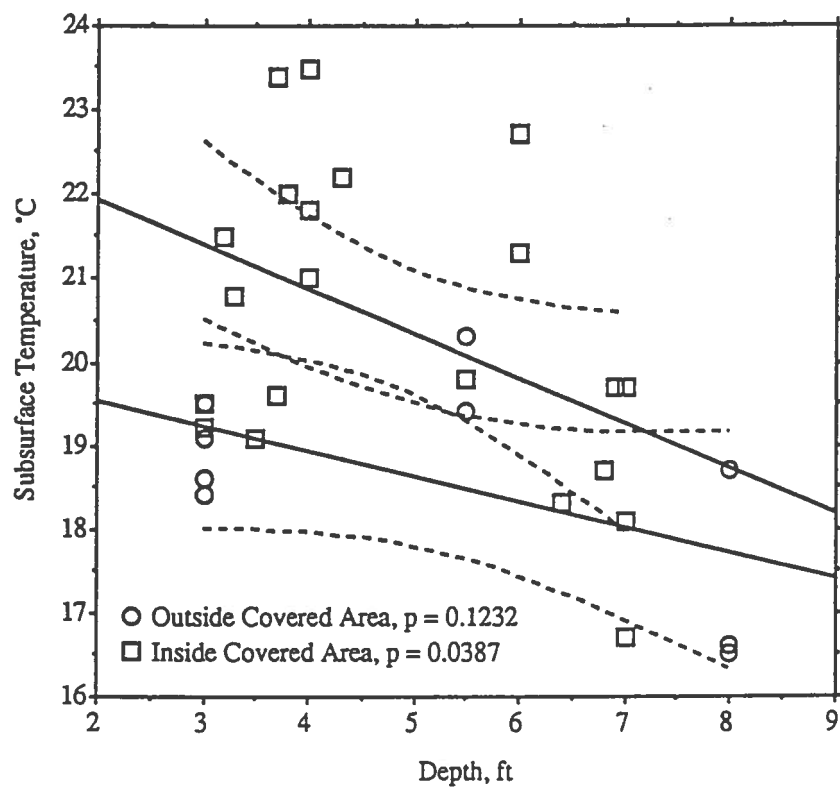
One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	9	21.378	3.516	1.172
Inside	9	19.344	2.849	.95

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	2.033	3.198	1.817	1.348

September 1994  
Cover Removed



# September 1994 Inside Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	3	22.444	7.481	2.894
Within groups	17	43.954	2.586	p = .0656
Total	20	66.398		

Model II estimate of between component variance = 1.134

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	19.35	.212	.15
M MP	1	19.8	.	.
S TC	10	21.49	1.436	.454
D TC	8	19.4	1.903	.673

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-.45	4.155	.017	.229
S MP vs. S TC	-2.14	2.628	.984	1.718
S MP vs. D TC	-.05	2.682	.001	.039
M MP vs. S TC	-1.69	3.558	.335	1.002
M MP vs. D TC	.4	3.598	.018	.235

# September 1994 Inside Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S TC vs. D TC	2.09	1.609*	2.503	2.74

\* Significant at 95%

# September 1994 Outside Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	8.808	4.404	6.245
Within groups	6	4.232	.705	p = .0342
Total	8	13.04		

Model II estimate of between component variance = 1.28

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	18.9	.497	.248
M MP	2	19.85	.636	.45
D MP	3	17.267	1.242	.717

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-.95	1.78	.853	1.306
S MP vs. D MP	1.633	1.569*	3.242	2.546
M MP vs. D MP	2.583	1.876*	5.677*	3.37

\* Significant at 95%

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	1.203	1.203	4.204
Within groups	4	1.145	.286	p = .1097
Total	5	2.348		

Model II estimate of between component variance = .344

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	18.9	.497	.248
M MP	2	19.85	.636	.45

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-.95	1.286	4.204	2.05



One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	6.64	6.64	2.415
Within groups	25	68.746	2.75	p = .1328
Total	26	75.387		

Model II estimate of between component variance = .417

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	6	19.217	.685	.28
Inside	21	20.41	1.822	.398

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-1.193	1.581	2.415	1.554

# September 1993 ANOVA, All Inside vs Deep APs Outside

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	25.929	25.929	8.209
Within groups	22	69.485	3.158	p = .009
Total	23	95.413		

Model II estimate of between component variance = 4.337

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

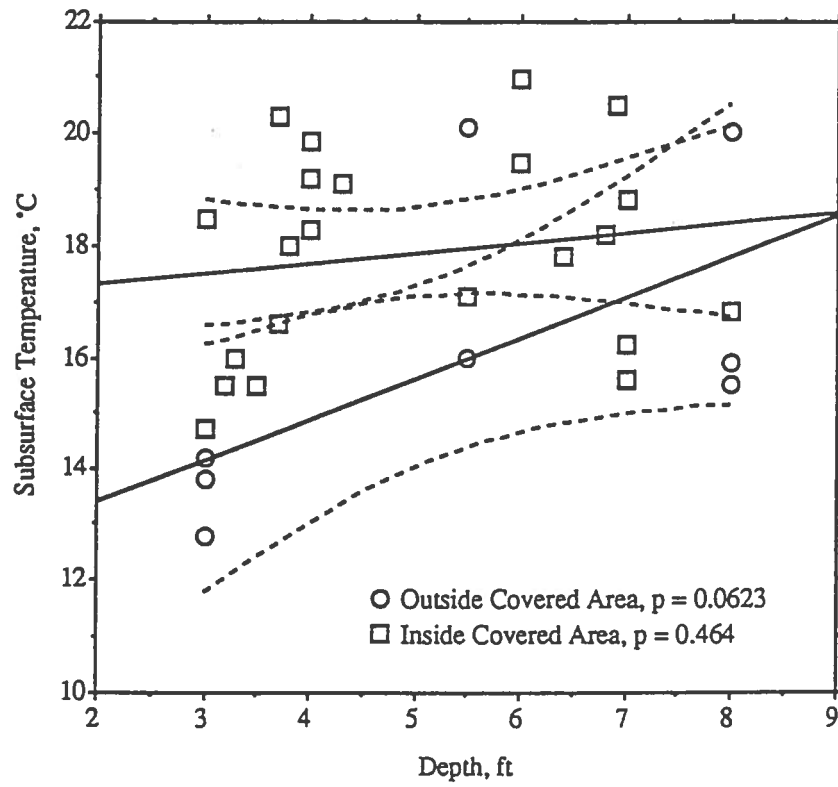
Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	3	17.267	1.242	.717
Inside	21	20.41	1.822	.398

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-3.143	2.275*	8.209*	2.865

\* Significant at 95%

October 1994  
Cover Removed



One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	4	7.664	1.916	.52
Within groups	17	62.664	3.686	p = .7224
Total	21	70.328		

Model II estimate of between component variance = -.496

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	16.6	2.687	1.9
M MP	1	17.1	.	.
D MP	1	16.8	.	.
S TC	10	17.84	1.821	.576
D TC	8	18.45	1.912	.676

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-.5	4.961	.011	.213
S MP vs. D MP	-.2	4.961	.002	.085
S MP vs. S TC	-1.24	3.138	.174	.834
S MP vs. D TC	-1.85	3.202	.371	1.219
M MP vs. D MP	3	5.729	.003	.11

October 1994 Inside Covered Area ANOVA Results  
 One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
M MP vs. S TC	-.74	4.248	.034	.367
M MP vs. D TC	-1.35	4.296	.11	.663
D MP vs. S TC	-1.04	4.248	.067	.516
D MP vs. D TC	-1.65	4.296	.164	.81
S TC vs. D TC	-.61	1.921	.112	.67

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	33.947	16.974	4.654
Within groups	6	21.882	3.647	p = .0602
Total	8	55.829		

Model II estimate of between component variance = 4.613

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	13.65	.597	.299
M MP	2	18.05	2.899	2.05
D MP	3	17.133	2.491	1.438

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-4.4	4.047*	3.539	2.66
S MP vs. D MP	-3.483	3.569	2.852	2.388
M MP vs. D MP	.917	4.266	.138	.526

\* Significant at 95%

October 1994 ANOVA, All Inside vs Outside

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	1	27.614	27.614	6.348
Within groups	29	126.157	4.35	p = .0175
Total	30	153.771		

Model II estimate of between component variance = 1.821

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

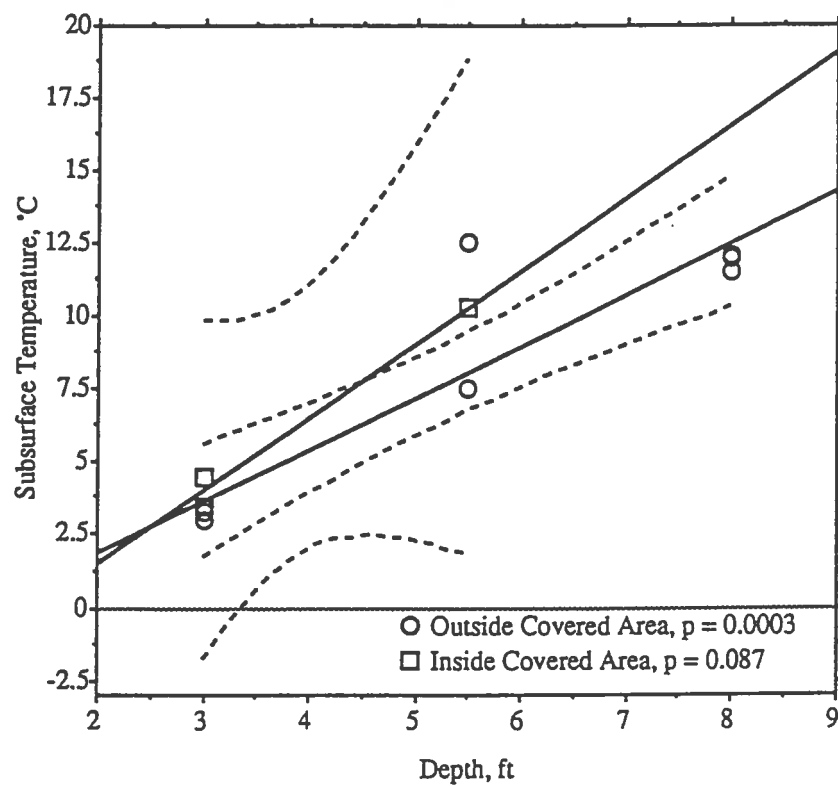
Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	9	15.789	2.642	.881
Inside	22	17.868	1.83	.39

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
Outside vs. Inside	-2.079	1.688*	6.348*	2.519

\* Significant at 95%

December 1994  
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One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	2	143.573	71.787	33.424
Within groups	6	12.887	2.148	p = .0006
Total	8	156.46		

Model II estimate of between component variance = 24.106

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	4	3.2	.245	.122
M MP	2	10	3.536	2.5
D MP	3	11.867	.321	.186

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-6.8	3.106*	14.353*	5.358
S MP vs. D MP	-8.667	2.739*	29.976*	7.743
M MP vs. D MP	-1.867	3.274	.973	1.395

\* Significant at 95%

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	4.181	4.181	.987
Within groups	3	12.707	4.236	p = .3937
Total	4	16.888		

Model II estimate of between component variance = -.023

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
M MP	2	10	3.536	2.5
D MP	3	11.867	.321	.186

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
M MP vs. D MP	-1.867	5.979	.987	.994

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	26.46	26.46	52.92
Within groups	1	.5	.5	p = .087
Total	2	26.96		

Model II estimate of between component variance = 19.47

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	4	.707	.5
M MP	1	10.3	.	.

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-6.3	11.004	52.92	7.275

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	14.417	14.417	2.656
Within groups	5	27.14	5.428	p = .1641
Total	6	41.557		

Model II estimate of between component variance = 2.622

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	4	3.2	.245	.122
Inside	3	6.1	3.672	2.12

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	-2.9	4.574	2.656	1.63

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	47.251	47.251	6.466
Within groups	6	43.848	7.308	p = .0439
Total	7	91.099		

Model II estimate of between component variance = 10.651

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

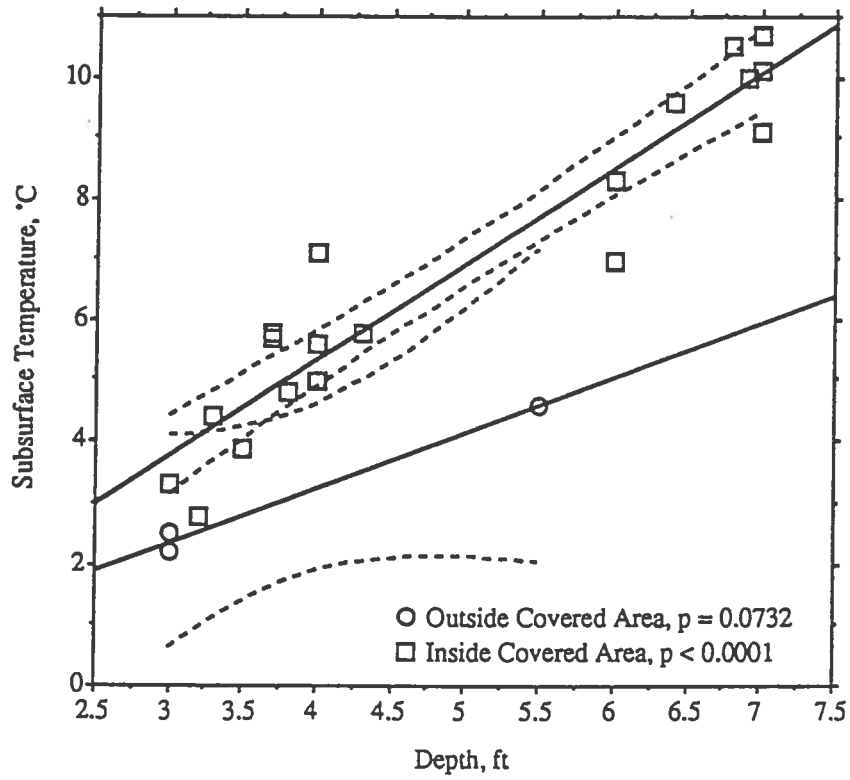
Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	5	11.12	2.055	.919
Inside	3	6.1	3.672	2.12

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	5.02	4.831*	6.466*	2.543

\* Significant at 95%

January 1995  
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One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	2	96.088	48.044	32.356
Within groups	16	23.758	1.485	p = .0001
Total	18	119.845		

Model II estimate of between component variance = 9.027

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	1	3.3	.	.
S TC	10	5.09	1.198	.379
D TC	8	9.412	1.245	.44

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnett t:
S MP vs. S TC	-1.79	2.709	.981	1.401
S MP vs. D TC	-6.112	2.74 *	11.183 *	4.729
S TC vs. D TC	-4.323	1.225 *	27.962 *	7.478

\* Significant at 95%

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	2.913	2.913	2.031
Within groups	9	12.909	1.434	p = .1879
Total	10	15.822		

Model II estimate of between component variance = .813

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	1	3.3	.	.
S TC	10	5.09	1.198	.379

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. S TC	-1.79	2.841	2.031	1.425



# January 1995 Outside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	3.375	3.375	75
Within groups	1	.045	.045	p = .0732
Total	2	3.42		

Model II estimate of between component variance = 2.498

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	2.35	.212	.15
M MP	1	4.6	.	.

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-2.25	3.301	75	8.66

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	7.87	7.87	4.908
Within groups	12	19.242	1.603	p = .0468
Total	13	27.112		

Model II estimate of between component variance = 1.329

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

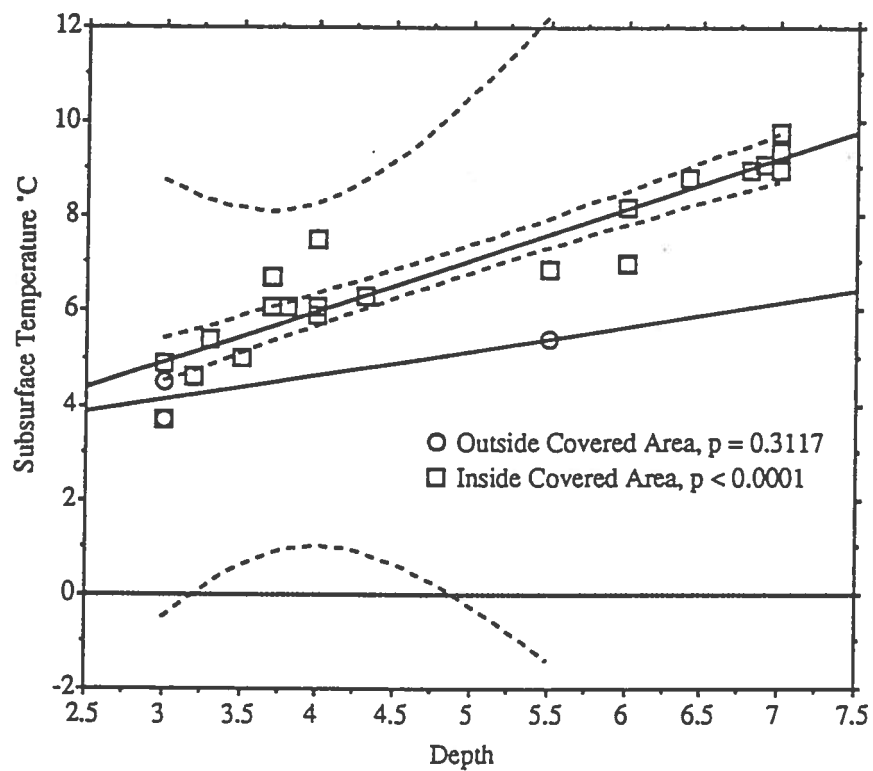
Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	3	3.1	1.308	.755
Inside	11	4.927	1.258	.379

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	-1.827	1.797*	4.908*	2.215

\* Significant at 95%

March 1995  
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# March 1995 Inside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test
Between groups	3	50.653	16.884	23.86
Within groups	17	12.03	.708	p = .0001
Total	20	62.683		

Model II estimate of between component variance = 3.747

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	4.3	.849	.6
M MP	1	6.9	.	.
S TC	10	5.97	.829	.262
D TC	8	8.788	.856	.303

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-2.6	2.174*	2.123	2.524
S MP vs. S TC	-1.67	1.375*	2.19	2.563
S MP vs. D TC	-4.488	1.403*	15.177*	6.748
M MP vs. S TC	.93	1.861	.37	1.054
M MP vs. D TC	-1.888	1.882*	1.492	2.115

\* Significant at 95%

Mid 1995 Inside Covered Area ANOVA Results  
 One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S TC vs. D TC	-2.818	.842*	16.619*	7.061

\* Significant at 95%

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	.786	.786	1.145
Within groups	9	6.181	.687	p = .3125
Total	10	6.967		

Model II estimate of between component variance = .055

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
M MP	1	6.9	.	.
S TC	10	5.97	.829	.262

One Factor ANOVA  $X_1$ : Type  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
M MP vs. S TC	.93	1.966	1.145	1.07

# March 1995 Outside Covered Area ANOVA Results

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	1.127	1.127	3.521
Within groups	1	.32	.32	p = .3117
Total	2	1.447		

Model II estimate of between component variance = .605

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
S MP	2	4.1	.566	.4
M MP	1	5.4	.	.

One Factor ANOVA X<sub>1</sub>: Type Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
S MP vs. M MP	-1.3	8.803	3.521	1.876

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	.065	.065	.09
Within groups	3	2.167	.722	p = .7832
Total	4	2.232		

Model II estimate of between component variance = -.274

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	3	4.533	.85	.491
Inside	2	4.3	.849	.6

One Factor ANOVA X<sub>1</sub>: Location Y<sub>1</sub>: Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	.233	2.469	.09	.301



March 1995 ANOVA, ☐ Low TC & Medium MP Inside vs ☐ w & Medium MP Outside

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	5.455	5.455	7.779
Within groups	12	8.414	.701	p = .0164
Total	13	13.869		

Model II estimate of between component variance = 1.008

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Outside	3	4.533	.85	.491
Inside	11	6.055	.835	.252

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Subsurface Temp, °C

Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Outside vs. Inside	-1.521	1.188*	7.779*	2.789

\* Significant at 95%

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**APPENDIX 29**

**MOISTURE CONTENT RESULTS FROM MONITORING POINTS IN THE VICINITY OF  
THE PLASTIC-COVERED AREA**

Soil Sample	Depth, ft bgs	Location	Initial MC, %	Final MC, %
MP-1, 1-1	7.5 to 8.0	Outside		4.84
MP-1, 2-2	5.0 to 5.5	Outside	2.87	
MP-1, 2-3	4.5 to 5.0	Outside	5.99	3.63
MP-1, 4-1	1.5 to 2.0	Outside	17.21	4.08
MP-1, 2-1	5.5 to 6.0	Outside	16.35	
MP-2, 1-1	7.5 to 8.0	Outside	1.46	
MP-2, 1-2	7.0 to 7.5	Outside	6.13	
MP-2, 1-3	6.5 to 7.0	Outside	5.53	
MP-2, 3-2	3.0 to 3.5	Outside	20.27	
MP-2, 3-3	2.5 to 3.0	Outside	2.79	
MP-5, 2-1	5.5 to 6.0	Outside	5.38	
MP-5, 2-2	5.0 to 5.5	Outside	2.62	
MP-5, 2-3	4.5 to 5.0	Outside	3.68	0.66
MP-5, 2-4	4.0 to 4.5	Outside	2.43	3.53
MP-5, 4-1	1.5 to 2.0	Outside	4.22	4.67
MP-6, 1-1	7.5 to 8.0	Outside	2.27	
MP-6, 3-1	3.5 to 4.0	Outside	7.23	
		Mean	6.65	3.57
MP-0, 1-2	7.0 to 7.5	Inside	1.43	
MP-0, 1-3	6.5 to 7.0	Inside	2.74	19.47
MP-0, 1-4	6.0 to 6.5	Inside		14.63
MP-0, 3-2	3.0 to 3.5	Inside	23.00	5.99
MP-0, 3-3	2.5 to 3.0	Inside	3.67	10.03
MP-3, 1-4	6.0 to 6.5	Inside		15.19
MP-3, 2-2	5.0 to 5.5	Inside	33.63	5.52
MP-3, 2-3	4.5 to 5.0	Inside	41.14	8.49
MP-3, 4-1	1.5 to 2.0	Inside	20.87	56.00
MP-3, 4-2	1.0 to 1.5	Inside	4.48	3.99
MP-4, 1-1	7.5 to 8.0	Inside	1.64	
MP-4, 1-2	7.0 to 7.5	Inside	4.24	
MP-4, 3-4	2.0 to 2.5	Inside	1.27	6.11
MP-4, 3-1	3.5 to 4.0	Inside	2.42	
MP-4, 3-2	3.0 to 3.5	Inside	13.98	
MP-4, 3-3	2.5 to 3.0	Inside	2.15	
		Mean	11.19	14.54

# Moisture Content Inside and Outside of Plastic-Covered Area ANOVA Results

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Moisture Content

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	1	526.977	526.977	4.563
Within groups	44	5081.43	115.487	p = .0383
Total	45	5608.407		

Model II estimate of between component variance = 17.925

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Moisture Content

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Inside	24	12.587	14.002	2.858
Outside	22	5.811	5.22	1.113

One Factor ANOVA  $X_1$ : Location  $Y_1$ : Moisture Content

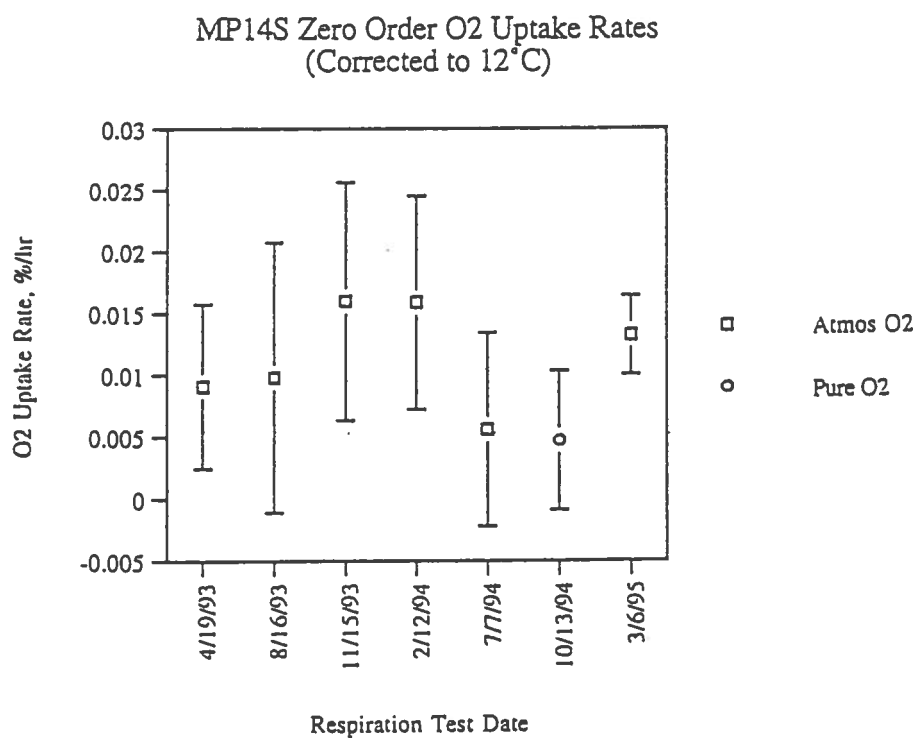
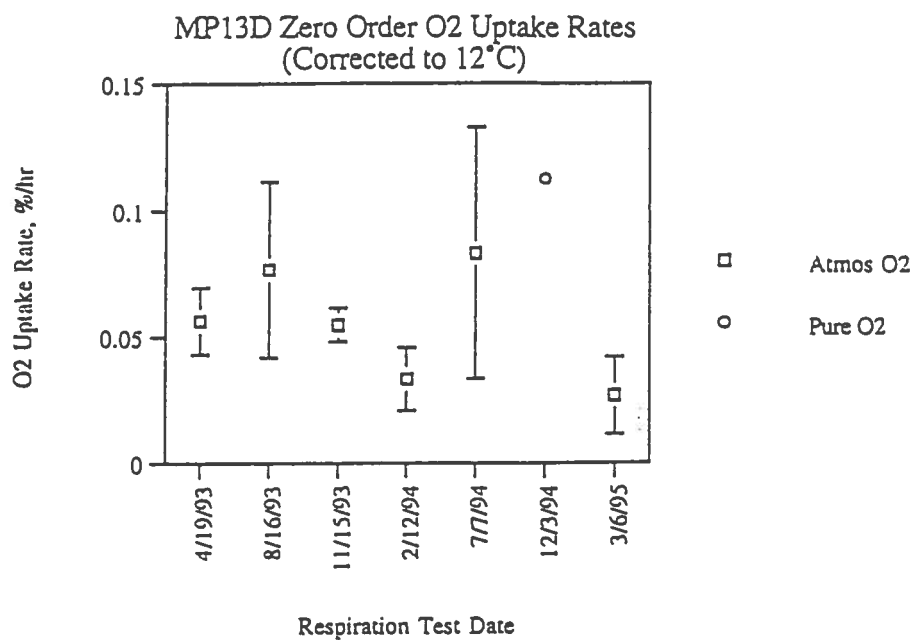
Comparison:	Mean Diff.:	Fisher PLSD:	Scheffe F-test:	Dunnnett t:
Inside vs. Outside	6.776	6.393*	4.563*	2.136

\* Significant at 95%

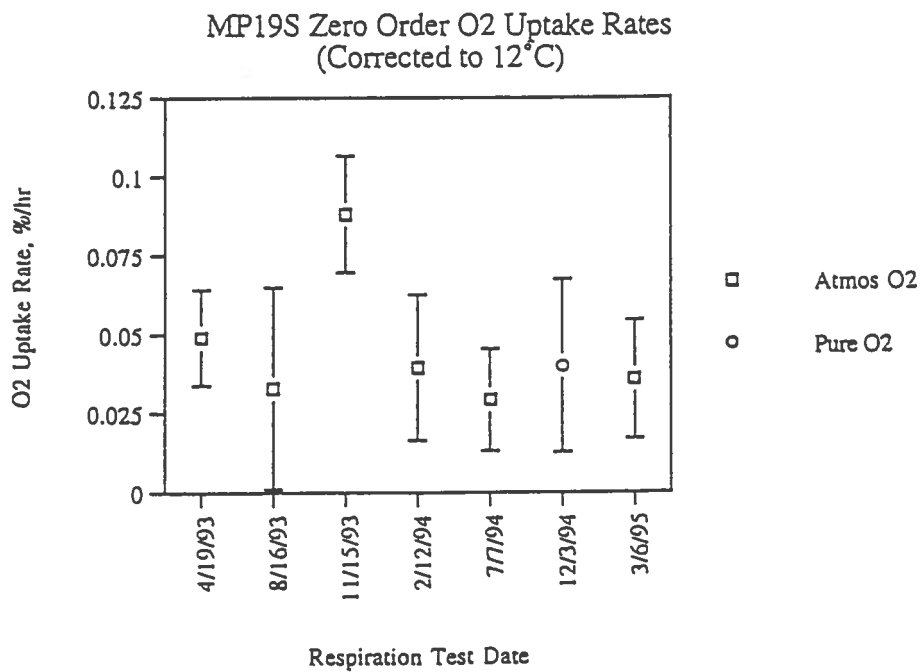
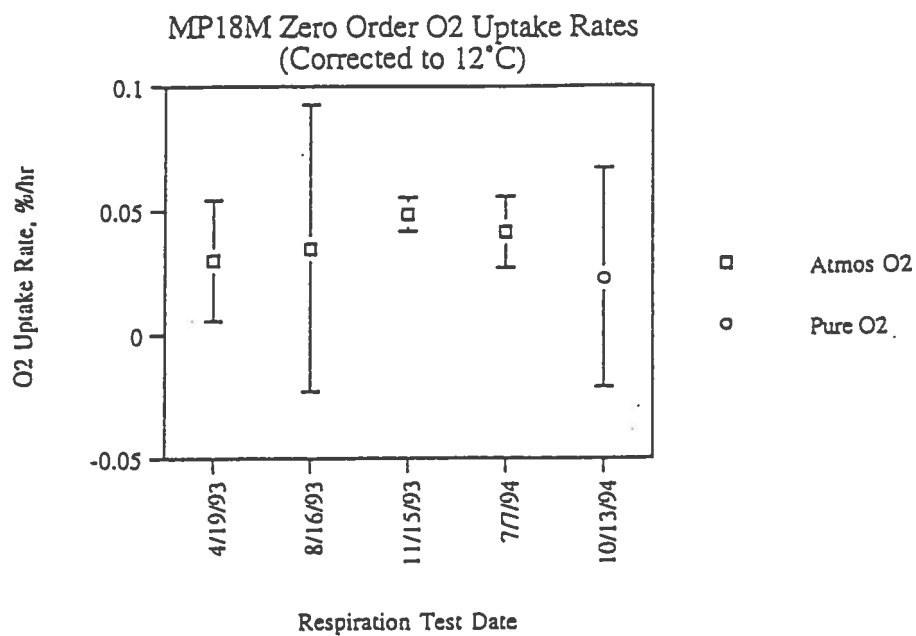
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## **APPENDIX 30**

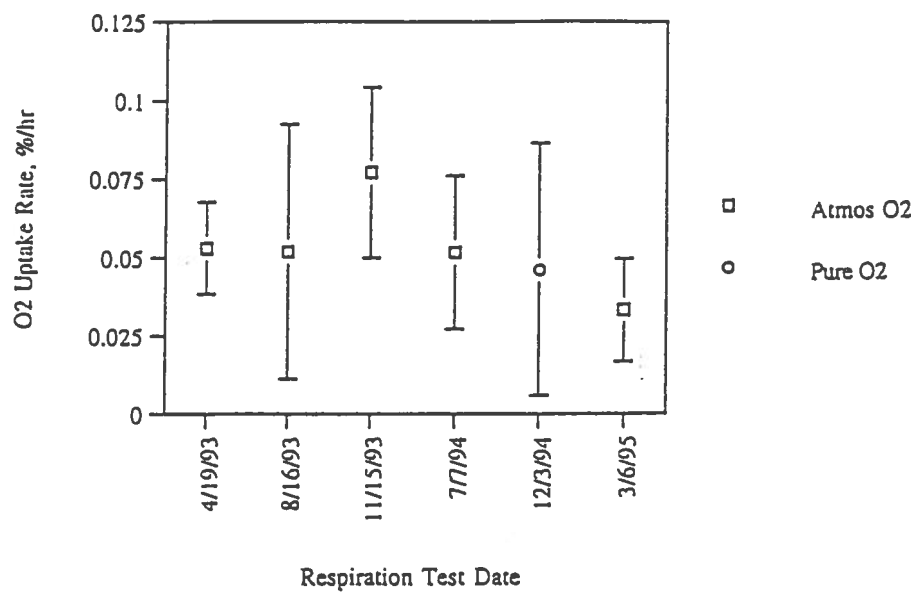
### **TEMPERATURE-CORRECTED RESPIRATION RATES AND PLOTS FOR MONITORING POINTS EXPERIENCING PURE O<sub>2</sub> AND AMBIENT AIR INJECTION**



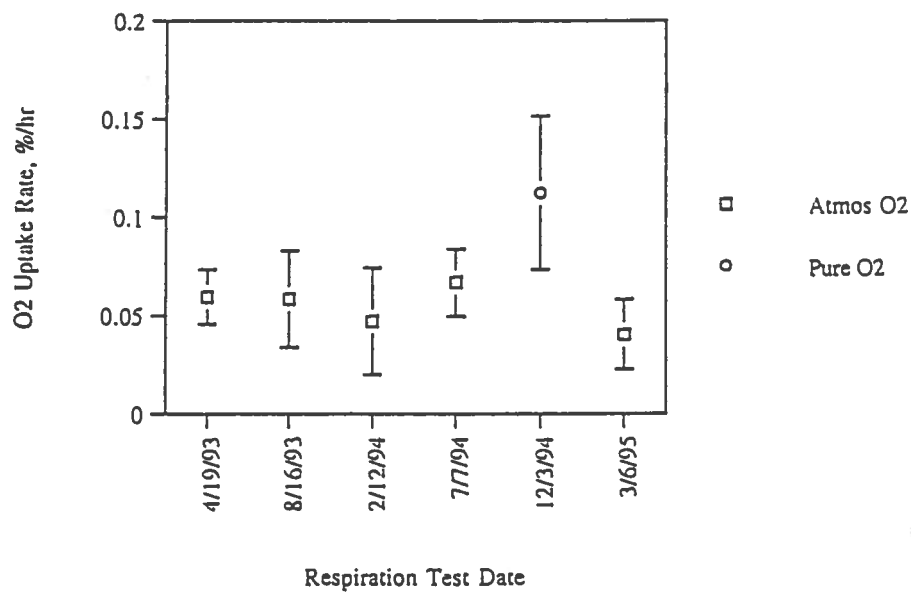




MP19M Zero Order O<sub>2</sub> Uptake Rates  
(Corrected to 12°C)



MP19D Zero Order O<sub>2</sub> Uptake Rates  
(Corrected to 12°C)



## **APPENDIX 31**

### **OXYGEN CONSUMPTION DATA FROM LABORATORY STUDIES EXAMINING THE EFFECT OF PURE O<sub>2</sub> ON RESPIRATION RATES**

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10,000 ppm TPH				1,000 ppm TPH				100 ppm TPH				1,000 ppm TPH			
almos O2		pure O2		almos O2		pure O2		almos O2		pure O2		almos O2		pure O2	
Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %
100.0	0.0	0.0	0.0	100	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
148.7	0.9	98.3	1.5	147	0.9	23	-1.0	28	0.3	28	2.5	23	-1.0	23	-1.0
238.8	2.2	147.8	4.9	268	9.1	46	-1.8	51	1.1	51	-0.2	48	-1.8	48	-1.8
315.9	7.2	197.6	3.9	315	16.2	95	-0.8	71	0.6	71	12.9	95	-0.8	95	-0.8
343.9	14.3	239.6	12.8	100	0.0	190	2.4	100	1.1	100	8.1	190	2.4	190	2.4
100.0	0.0	278.1	17.3	172	1.4	281	12.1	123	1.7	0	0.0	261	12.1	261	12.1
195.4	1.3	310.8	16.4	277	11.0	0	0.0	147	2.3	0	0.0	0	0.0	0	0.0
266.3	3.3	334.8	28.9	290	12.8	23	-0.7	187	3.0	1.1	1.1	23	-0.7	23	-0.7
334.9	16.0	339.4	33.9	324	15.9	70	0.8	240	3.9	3.7	3.7	70	0.8	70	0.8
343.9	18.2	0.0	0.0	100	0.0	95	0.8	287	2.7	4.1	4.1	95	0.8	95	0.8
100.0	0.0	119.8	-1.5	218	2.8	148	2.4	335	4.5	0.0	0.0	148	2.4	148	2.4
214.3	1.6	169.0	3.2	301	14.4	221	3.9	380	5.5	1.3	1.3	221	3.9	221	3.9
287.3	5.0	216.3	4.3	100	0.0	0	0.0	409	5.8	1.8	1.8	0	0.0	0	0.0
340.2	16.5	282.8	2.8	147	0.9	23	-0.4	428	5.7	4.1	4.1	23	-0.4	23	-0.4
343.9	16.7	301.8	8.8	268	9.8	95	0.8	477	8.0	4.2	4.2	95	0.8	95	0.8
100.0	0.0	322.1	9.9	315	16.5	186	4.4	524	6.5	0.0	0.0	186	4.4	186	4.4
195.4	1.4	334.8	10.0	324	18.5	240	7.4	0	0.0	0	-0.5	240	7.4	240	7.4
286.3	3.2	339.4	10.2	348	18.4	0	0.0	26	0.4	0	-2.8	0	0.0	0	0.0
334.9	10.7	0.0	0.0	411	22.5	23	-0.7	51	1.1	75	-0.1	23	-0.7	23	-0.7
343.9	17.5	98.3	7.8	491	25.3	95	0.8	71	0.8	126	17.5	95	0.8	95	0.8
355.3	17.5	147.8	1.8	607	28.8	186	0.4	100	2.0	172	-2.2	166	0.4	166	0.4
380.0	17.5	197.6	0.5	650	29.2	240	8.9	123	2.1	240	1.3	240	8.9	240	8.9
381.6	17.5	239.6	7.7	100	0.0	268	9.7	147	2.8	312	-0.4	286	9.7	286	9.7
387.8	17.5	276.1	27.9	172	1.3	309	16.3	187	2.8	0	0.0	309	16.3	309	16.3
393.2	17.5	310.6	8.0	277	10.8	381	22.1	240	2.7	28	2.0	361	22.1	361	22.1
100.0	0.0	334.8	19.7	290	12.3	0	0.0	287	3.3	51	-0.1	0	0.0	0	0.0
214.3	1.4	339.4	21.5	324	15.9	23	0.1	335	3.6	75	4.7	23	0.1	23	0.1
287.3	4.3	0.0	0.0	324	15.9	46	-0.3	380	5.2	128	2.8	48	-0.3	48	-0.3
340.2	10.3	119.8	-0.7	386	18.8	125	2.8	428	5.2	172	5.8	125	2.8	125	2.8
343.9	10.3	169.0	0.1	440	22.1	190	11.0	477	5.3	240	9.0	190	11.0	190	11.0
367.3	15.1	218.3	2.4	531	24.8	261	11.0	524	5.8	312	2.0	281	11.0	281	11.0
380.0	18.9	282.8	11.4	650	27.4	286	11.0	0	0.0	0	0.0	286	11.0	286	11.0
381.8	19.4	310.8	2.5	100	0.0	334	25.0	26	0.1	28	11.7	334	25.0	334	25.0
387.6	21.8	322.1	8.1	218	3.4	405	0.0	51	0.4	51	0.7	405	0.0	405	0.0
393.2	23.1	334.8	8.5	301	14.6	0	0.0	71	0.8	75	2.7	0	0.0	0	0.0
100.0	0.0	339.4	11.5	324	14.6	23	-1.0	100	2.4	126	2.4	23	-1.0	23	-1.0
146.7	0.7	340.1	11.5	348	18.4	70	0.7	123	1.4	172	9.8	70	0.7	70	0.7
238.8	2.1	348.0	7.5	411	19.7	148	2.0	147	2.2	240	9.8	148	2.0	148	2.0
315.9	6.6	358.1	9.3	491	23.3	221	1.0	187	2.8	312	2.8	221	1.0	221	1.0
343.9	11.7	363.3	14.8	607	26.8	268	9.4	240	3.2	0	0.0	268	9.4	268	9.4
355.3	14.4	370.0	8.8	650	26.8	285	13.0	287	4.1	28	2.3	285	13.0	285	13.0
380.0	25.1	381.2	14.7	100	0.0	358	25.0	335	3.9	51	-0.9	358	25.0	358	25.0
381.8	26.0	386.8	18.0	147	0.8	430	22.9	380	5.4	75	3.0	430	22.9	430	22.9
387.2	27.7	392.9	17.8	268	8.8	0	0.0	428	5.1	128	-1.2	0	0.0	0	0.0
393.2	26.4	0.0	0.0	315	15.8	23	-2.4	477	5.8	172	0.9	23	-2.4	23	-2.4
100.0	0.0	96.3	9.0	324	15.8	70	-1.4	524	6.0	240	2.7	70	-1.4	70	-1.4
195.4	1.4	147.8	7.9	388	18.8	148	-0.4	0	-0.4	312	3.4	148	-0.4	148	-0.4

10,000 ppm TPH				1,000 ppm TPH				100 ppm TPH				1,000 ppm TPH			
almos O2		pure O2		almos O2		pure O2		almos O2		pure O2		almos O2		pure O2	
Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %
288.3	3.0	197.8	6.0	440	22.2	221	2.5			381	4.1	221	4.1	221	2.5
334.9	13.1	239.8	9.1	531	24.6	268	9.4			442	4.6	268	4.6	268	9.4
343.9	18.0	276.1	13.1	100	0.0	285	13.2			514	1.3	285	1.3	285	13.2
367.3	24.7	301.8	18.0	172	1.4	358	20.1			0	0.0	358	0.0	358	20.1
380.0	29.1	334.8	23.3	290	12.7	430	23.1			28	-4.3	430	-4.3	430	23.1
381.6	29.8	339.4	23.5	324	16.0	454	25.2			51	-1.5	454	-1.5	454	25.2
387.2	31.0	340.1	23.5	324	16.0	454	25.2			75	0.3	454	0.3	454	25.2
393.2	31.9	346.0	20.7	348	17.4	528	20.0			128	0.3	528	0.3	528	20.0
403.6	35.1	356.1	21.1	411	21.2	550	28.6			172	-1.1	550	-1.1	550	28.6
411.7	37.4	383.3	24.1	491	24.0	573	29.8			240	1.8	573	1.8	573	29.8
420.0	38.2	370.0	24.8	807	26.2	621	30.3			312	-0.3	621	-0.3	621	30.3
427.2	38.6	381.2	30.4	100	0.0	0	0.0			381	-0.7	0	0.0	0	0.0
438.9	39.9	386.8	28.7	218	3.3	23	-1.2			442	2.8	23	2.8	23	-1.2
450.7	41.8	392.9	31.2	301	14.2	95	-0.2			525	2.1	95	2.1	95	-0.2
462.6	43.2	0.0	0.0	324	14.2	168	1.9			0	0.0	168	0.0	168	1.9
474.3	43.8	119.8	1.2	368	17.1	240	8.9			28	0.9	240	0.9	240	8.9
100.0	0.0	169.0	4.1	440	20.7	288	10.0			51	0.0	288	0.0	288	10.0
214.3	1.5	216.3	11.1	531	23.7	309	13.8			75	5.7	309	5.7	309	13.8
287.3	4.8	282.8	8.3			381	20.4			126	1.4	381	1.4	381	20.4
340.2	15.8	301.8	12.3			434	23.5			172	-0.3	434	-0.3	434	23.5
343.9	17.0	310.6	15.6			478	24.9			240	22.5	478	22.5	478	24.9
355.3	17.0	322.1	16.7			550	28.8			312	1.4	550	1.4	550	28.8
380.0	17.0	334.6	25.8			598	28.8			381	2.1	598	2.1	598	28.8
387.8	17.0	339.4	29.8			621	28.5			442	4.1	621	4.1	621	28.5
393.2	17.0	340.1	29.8			0	0.0			525	3.4	0	0.0	0	0.0
403.6	18.7	348.0	29.4			23	-0.7			0	0.0	23	0.0	23	-0.7
411.7	19.1	358.1	32.0			46	0.9			28	-0.2	46	-0.2	46	0.9
420.0	20.1	363.3	33.7			125	-0.2			51	-0.3	125	-0.3	125	-0.2
427.2	19.4	370.0	34.7			190	2.4			75	3.8	190	3.8	190	2.4
438.9	21.0	381.2	39.4			281	8.8			128	2.1	281	2.1	281	8.8
450.7	24.2	386.8	41.4			266	10.7			172	0.7	266	0.7	266	10.7
462.8	25.1	392.9	44.6			324	20.4			240	10.7	324	10.7	324	20.4
474.3	26.8	0.0	0.0			405	23.0			312	2.8	405	2.8	405	23.0
100.0	0.0	96.3	1.4			434	24.2			381	4.1	434	4.1	434	24.2
195.4	1.8	147.8	8.8			454	22.5			442	4.3	454	4.3	454	22.5
238.8	3.2	197.6	2.3			528	23.6			525	3.8	528	3.8	528	23.6
315.9	9.3	239.8	7.1			573	28.1			0	0.0	573	0.0	573	28.1
334.9	11.8	297.1	10.1			621	28.1			28	-0.8	621	-0.8	621	28.1
343.9	13.3	301.8	11.3			0	0.0			51	-0.9	0	0.0	0	0.0
367.3	18.8	310.6	15.0			23	-2.3			75	0.6	23	0.6	23	-2.3
380.0	25.9	0.0	0.0			46	-0.1			128	3.3	46	3.3	46	-0.1
387.6	26.4	169.0	0.7			125	-1.8			172	-2.4	125	-2.4	172	-1.8
393.2	27.0	216.3	4.5			190	1.0			240	-0.8	190	-0.8	240	1.0
403.6	30.8	262.6	12.5			281	9.3			312	-0.7	281	-0.7	312	9.3
411.7	32.7	287.7	10.7			368	9.5			381	-0.4	368	-0.4	381	9.5
420.0	34.8	301.8	15.8			442	17.9			442	0.7	442	0.7	442	17.9
427.2	34.7	322.1	8.0			405	21.1			525	0.8	405	0.8	525	21.1

10,000 ppm TPH				1,000 ppm TPH				100 ppm TPH				1,000 ppm TPH			
atmos O2		pure O2		atmos O2		pure O2		atmos O2		pure O2		atmos O2		pure O2	
Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %
438.9	36.5	334.8	18.3			434	23.1			0	0.0			434	23.1
450.7	38.4	339.4	13.7			454	27.8			28	0.8			454	27.8
482.8	40.0	340.1	13.7			478	28.2			51	-1.2			478	26.2
474.3	41.2	348.0	8.8			598	30.4			75	1.2			598	30.4
486.3	43.4	358.1	11.0			821	31.4			126	2.7			621	31.4
498.9	45.0	363.3	15.9			0	-1.2			172	-1.7			0	0.0
509.2	48.0	370.0	13.3			23	-1.5			240	2.5			23	-0.3
522.7	45.2	381.2	18.1			70	0.4			312	0.4			70	1.6
533.8	48.4	388.8	17.4			148	0.2			381	5.8			148	1.5
548.3	48.5	392.9	22.9			221	3.7			442	2.6			221	4.9
558.4	50.2	393.8	22.9			288	9.5			525	2.8			288	10.7
571.4	49.4	405.3	27.8			285	12.0			Bold #'s indicate outliers					
582.4	49.8	410.8	28.7			358	23.2							285	13.2
596.1	52.0	417.2	31.2			430	22.8							358	24.4
605.9	53.0	429.0	39.2			0	0.0							430	24.1
816.2	53.1	442.5	37.0			23	-1.0							0	0.0
629.9	54.0	454.2	38.7			95	0.3							23	-1.0
842.0	55.2	465.1	41.2			166	3.9							95	0.3
654.5	56.3	477.5	39.2			240	5.1							166	3.9
685.9	58.8	0.0	0.0			286	11.2							240	5.1
694.9	58.2	96.3	8.3			309	18.2							286	11.2
100.0	0.0	147.8	4.7			381	28.0							309	18.2
268.3	2.8	197.8	9.3			434	24.8							381	28.0
343.9	17.7	239.6	9.9			478	28.8							434	24.8
355.3	21.2	297.1	10.7			520	27.3							478	26.8
380.0	30.3	301.8	11.8			550	31.2							520	27.3
382.2	30.8	310.8	12.9			573	31.9							550	31.2
387.2	31.4	334.8	17.2			598	33.2							573	31.9
393.2	32.5	339.4	20.8			621	32.5							598	33.2
403.8	35.4	340.1	20.8											621	32.5
411.7	38.1	346.0	16.1											150	0.0
420.0	39.5	358.1	20.0											173	1.9
427.2	40.7	363.3	25.3											198	1.3
438.9	41.8	370.0	28.4											220	3.0
450.7	44.1	381.2	27.7											245	10.3
482.8	44.8	388.8	26.2											257	14.9
474.3	45.7	392.9	29.2											275	19.7
486.3	47.9	393.8	29.2											298	24.2
498.9	49.0	405.3	29.2											318	33.4
509.2	50.4	410.8	29.2											340	29.2
522.7	51.0	417.2	31.5											371	31.1
533.8	52.8	429.0	31.8											390	34.5
548.3	53.0	442.5	37.4											411	42.7
558.4	54.0	454.2	35.2											484	40.1
571.4	54.3	465.1	37.5											508	41.9
582.4	54.8	477.5	37.9											531	49.0
596.1	58.3	0.0	0.0											150	0.0
														173	0.8

10,000 ppm TPH				1,000 ppm TPH				100 ppm TPH				1,000 ppm TPH			
almos O2		pure O2		almos O2		pure O2		almos O2		pure O2		almos O2		pure O2	
Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %
605.8	58.9	189.0	7.1											196	2.1
818.2	57.8	218.3	8.8											220	3.5
829.9	58.5	287.7	10.9											245	10.0
842.0	59.4	310.8	11.4											257	9.2
854.5	60.8	322.1	10.8											286	18.1
865.9	61.0	334.8	10.8											275	19.4
894.9	83.1	339.4	13.4											298	23.4
100.0	0.0	340.1	13.4											316	27.1
214.3	1.8	346.0	11.5											340	29.3
287.3	3.1	358.1	11.7											371	32.1
340.2	11.2	383.3	15.5											390	33.8
343.9	11.7	370.0	15.8											411	34.8
387.3	16.4	381.2	17.1											508	40.2
380.0	20.1	388.8	17.4											531	41.9
387.8	23.3	392.9	21.1											150	-0.8
393.2	25.1	393.8	21.1											173	-0.2
403.8	30.8	405.3	22.4											198	1.8
411.7	31.9	410.8	24.0											220	2.8
420.0	34.9	417.2	27.8											245	8.1
427.2	35.8	429.0	28.7											257	15.9
438.9	38.0	442.5	35.2											288	18.7
450.7	40.8	454.2	38.0											275	18.1
462.8	42.3	485.1	41.9											298	18.4
474.3	43.8	477.5	42.4											316	25.0
486.3	45.7	477.9	42.4											340	26.8
498.9	47.7	489.3	44.1											371	29.3
509.2	49.0	501.0	49.2											390	31.5
522.7	49.8	512.7	50.8											411	31.6
533.8	51.5	524.8	53.1											484	38.4
548.3	52.1	538.6	55.3											508	38.0
558.4	53.2	548.7	55.7											531	39.6
571.4	53.7	577.8	81.2												
582.4	54.8	0.0	0.0												
598.1	55.9	98.3	9.3												
805.9	58.9	147.8	4.3												
818.2	57.8	197.8	7.9												
829.9	58.7	239.8	14.2												
842.0	59.5	297.1	10.0												
854.5	80.7	301.8	10.7												
865.9	80.9	334.8	18.5												
694.9	82.8	339.4	21.1												
		340.1	21.1												
		348.0	14.7												
		358.1	17.4												
		383.3	21.2												
		370.0	23.9												
		381.2	26.8												





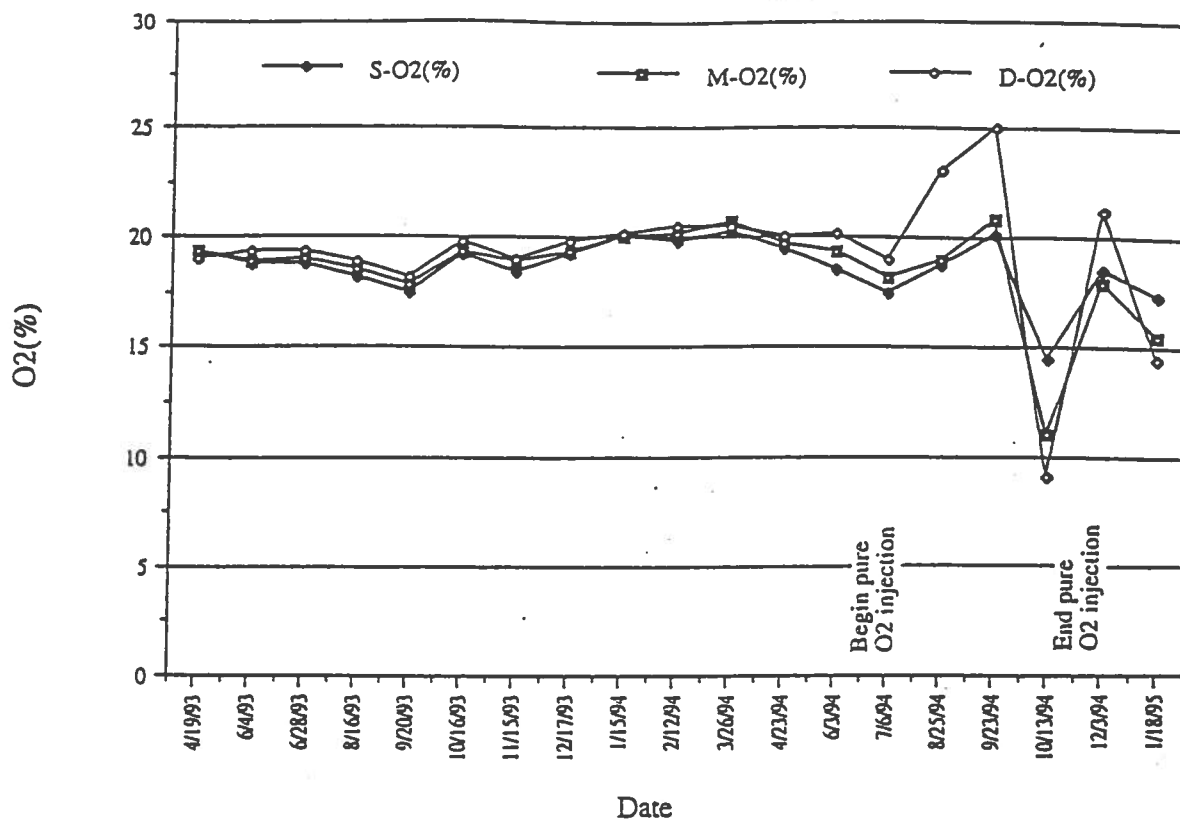
10,000 ppm TPH				1,000 ppm TPH				100 ppm TPH				1,000 ppm TPH			
almos O2		pure O2		almos O2		pure O2		almos O2		pure O2		almos O2		pure O2	
Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %	Elapsed Time, hr	Cumulative O2 Consumed, %
		512.7	45.8												
		524.8	48.4												
		536.8	49.5												
		548.7	50.5												
		577.8	55.1												

## **APPENDIX 32**

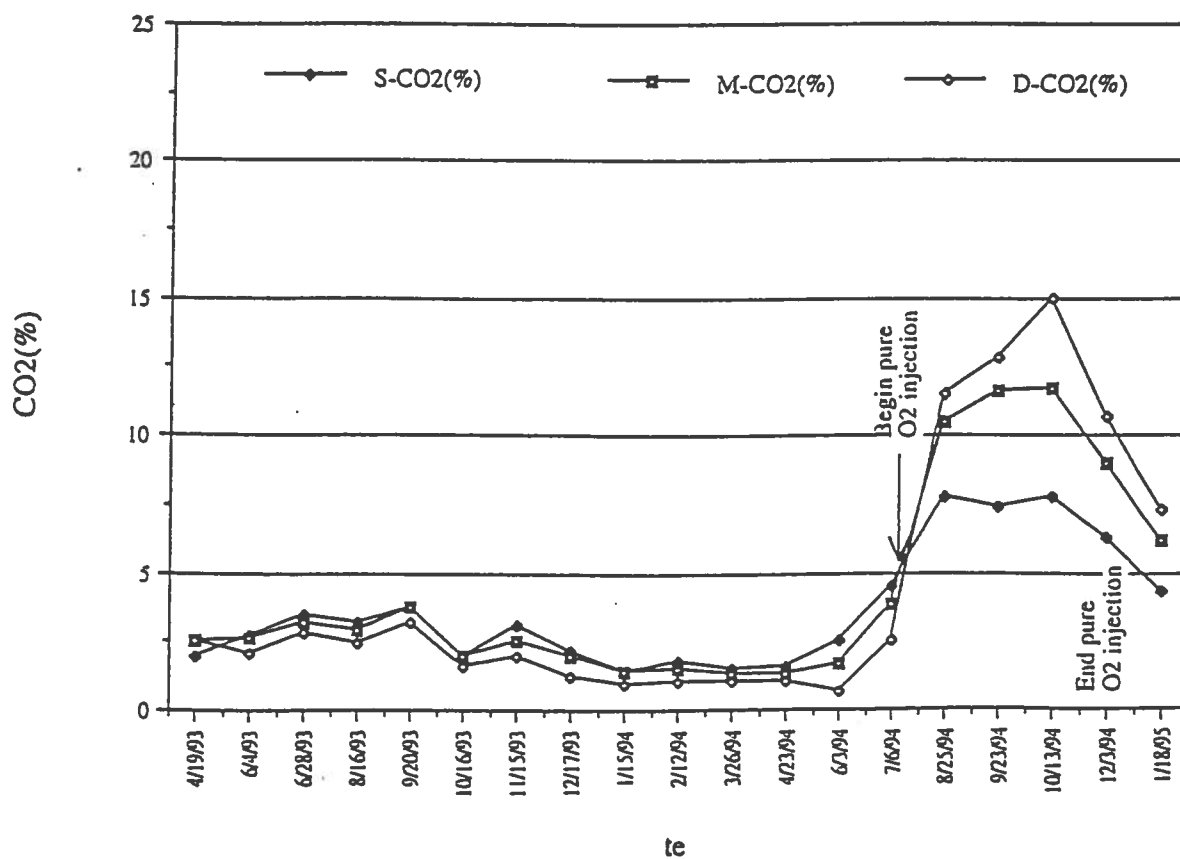
**PLOTS OF O<sub>2</sub> AND CO<sub>2</sub> CONCENTRATIONS AT MONITORING POINTS AFFECTED BY  
PURE O<sub>2</sub> INJECTION AT I13**

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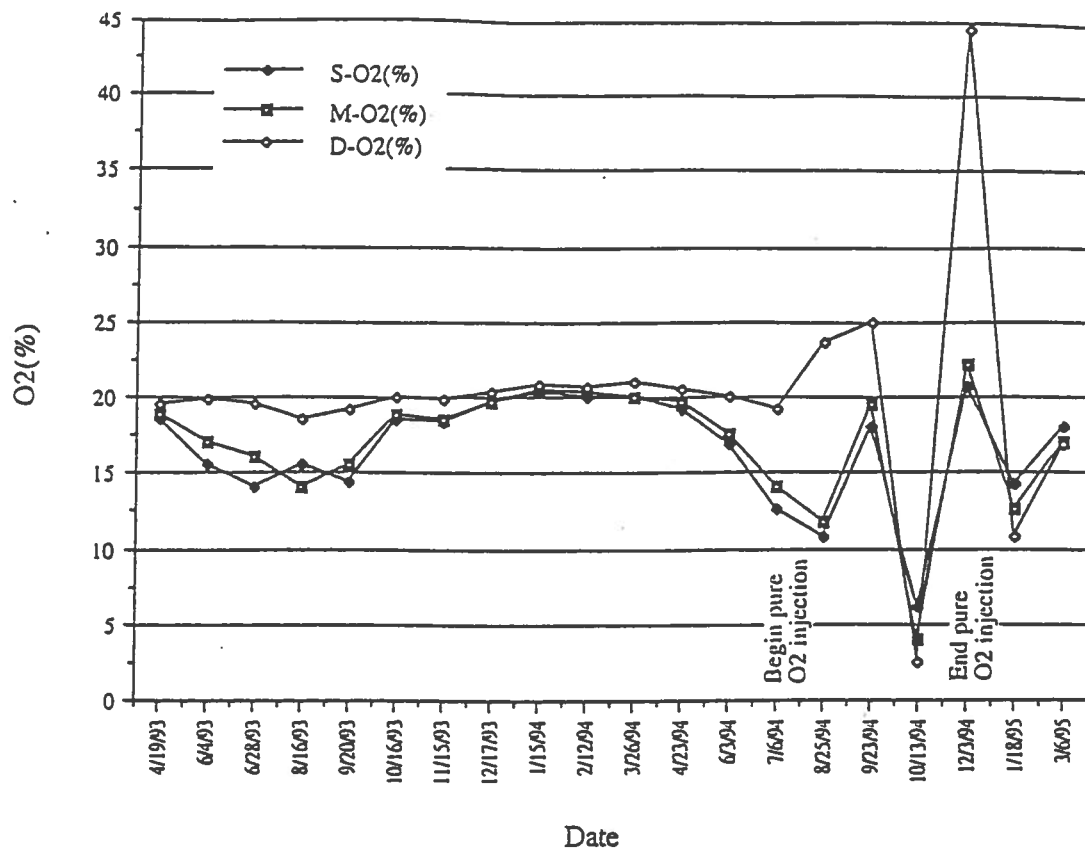
Measured O<sub>2</sub> Concentrations at MP-14, FPTA No. 1, FE Warren AFB



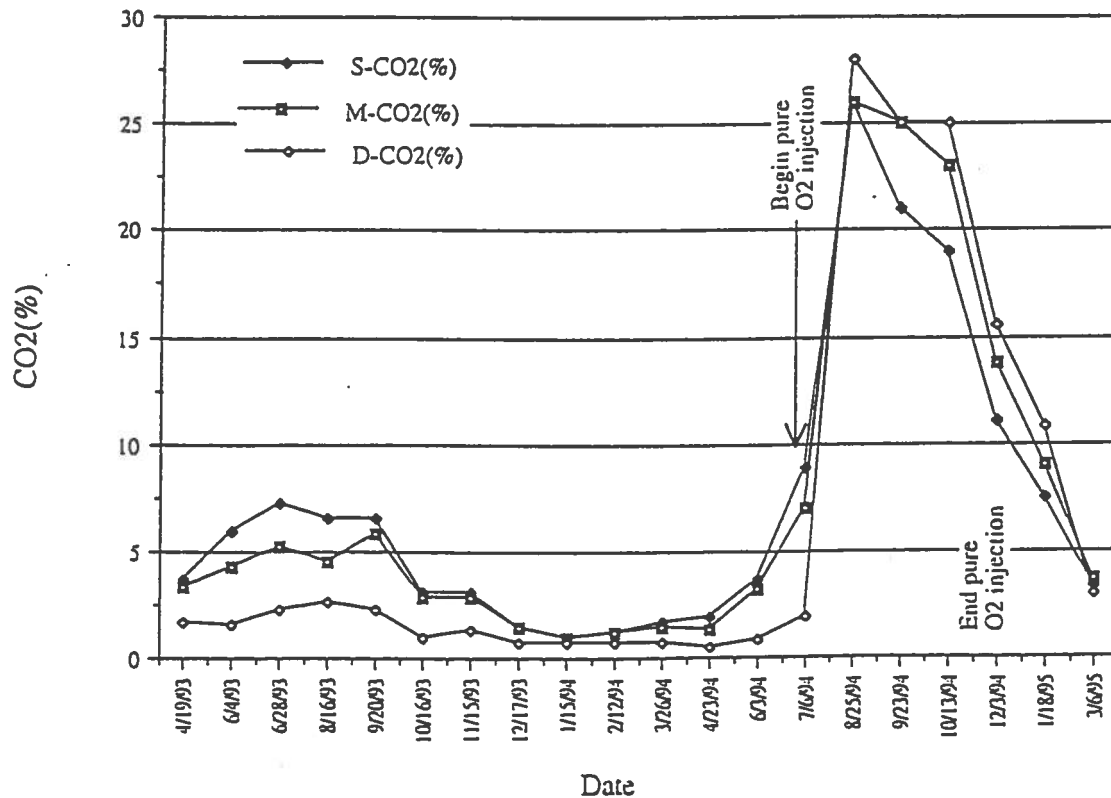
Measured CO<sub>2</sub> Concentrations at MP-14, FPTA No. 1, FE Warren AFB



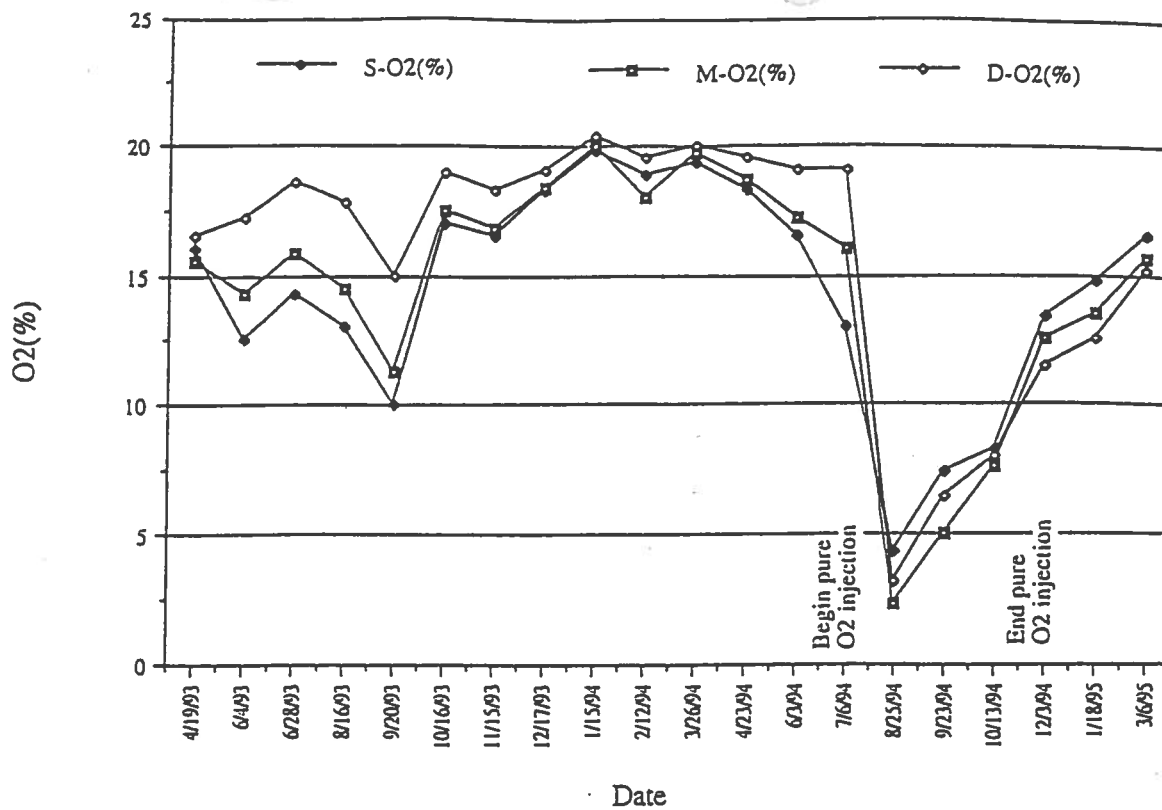
Measured O<sub>2</sub> Concentrations at MP-13, FPTA No. 1, FE Warren AFB



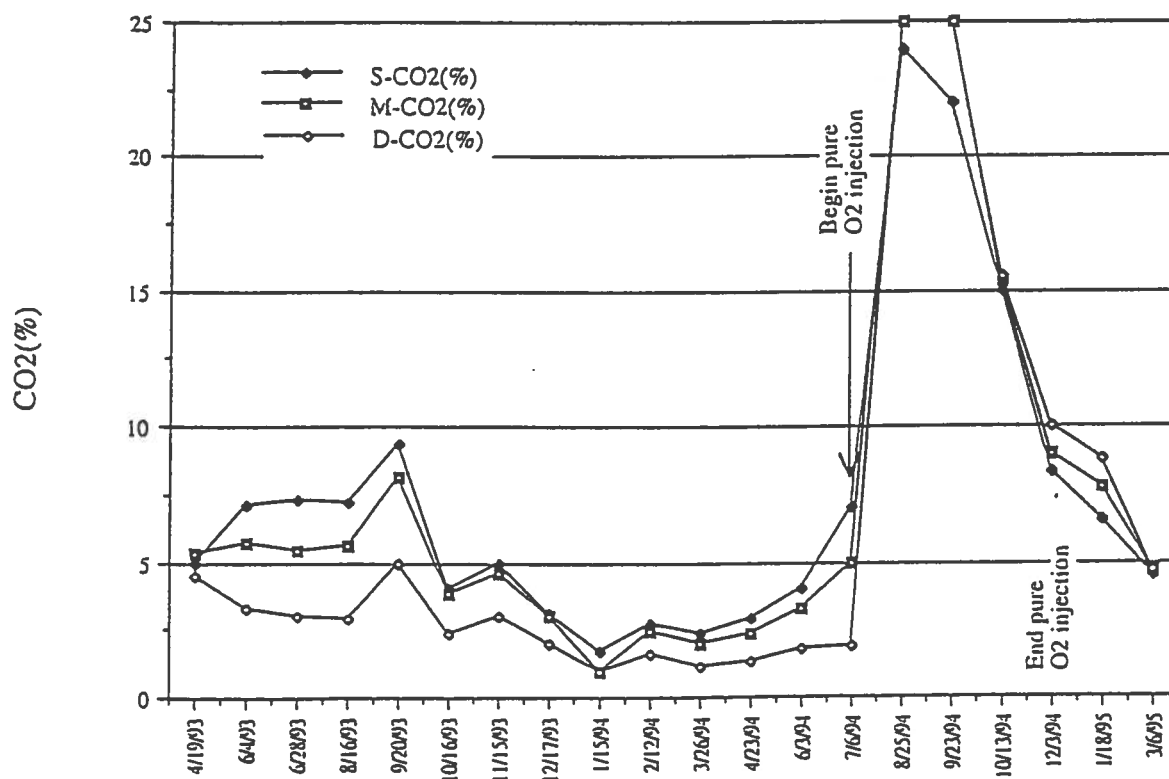
Measured CO<sub>2</sub> Concentrations at MP-13, FPTA No. 1, FE Warren AFB



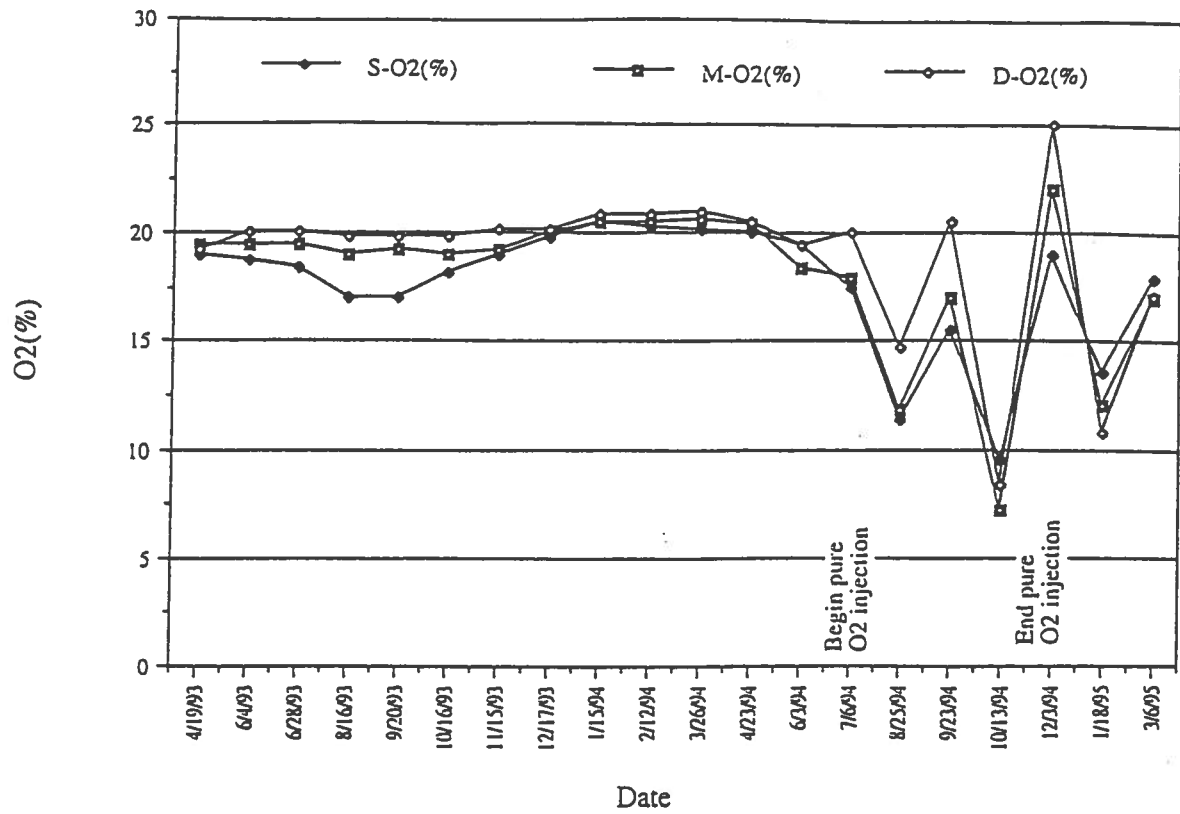
Measured O<sub>2</sub> Concentrations at MP-18, FPTA No. 1, FE Warren AFB



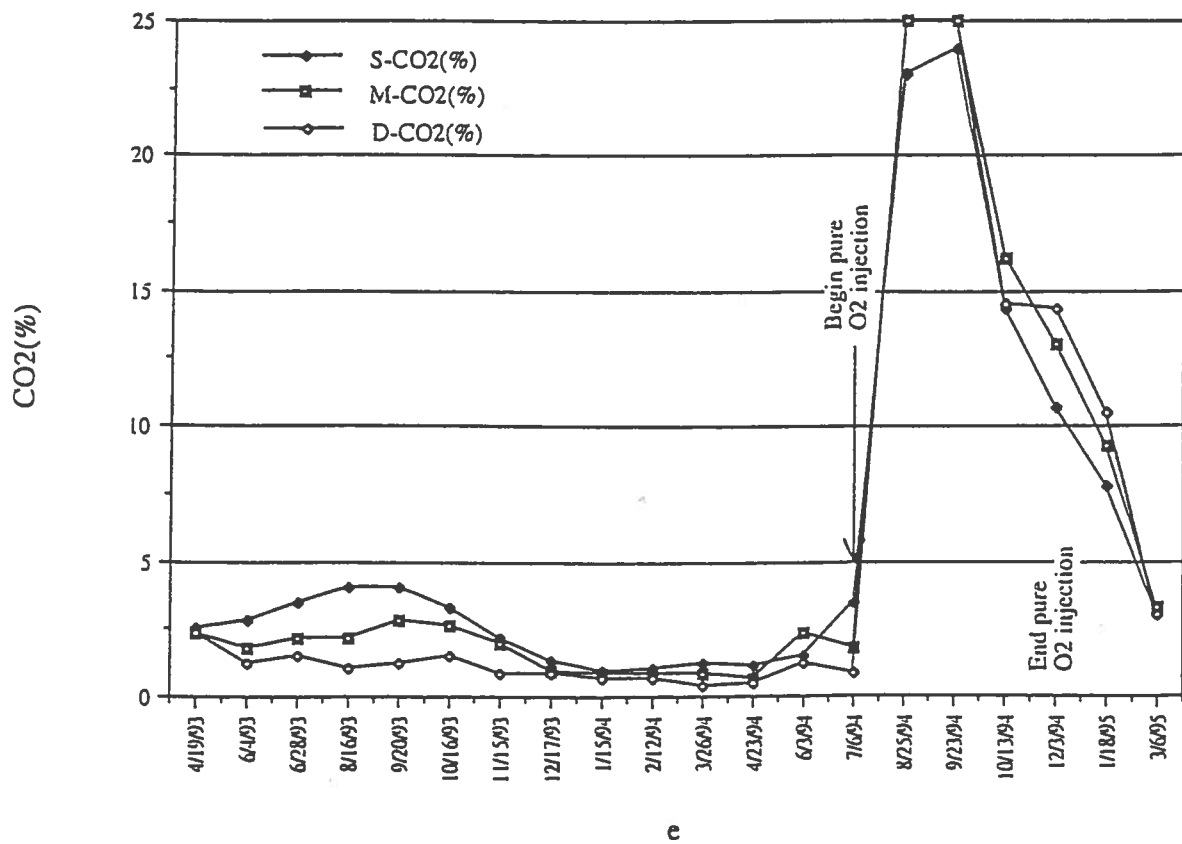
Measured CO<sub>2</sub> Concentrations at MP-18, FPTA No. 1, FE Warren AFB



Measured O<sub>2</sub> Concentrations at MP-19, FPTA No. 1, FE Warren AFB



Measured CO<sub>2</sub> Concentrations at MP-19, FPTA No. 1, FE Warren AFB



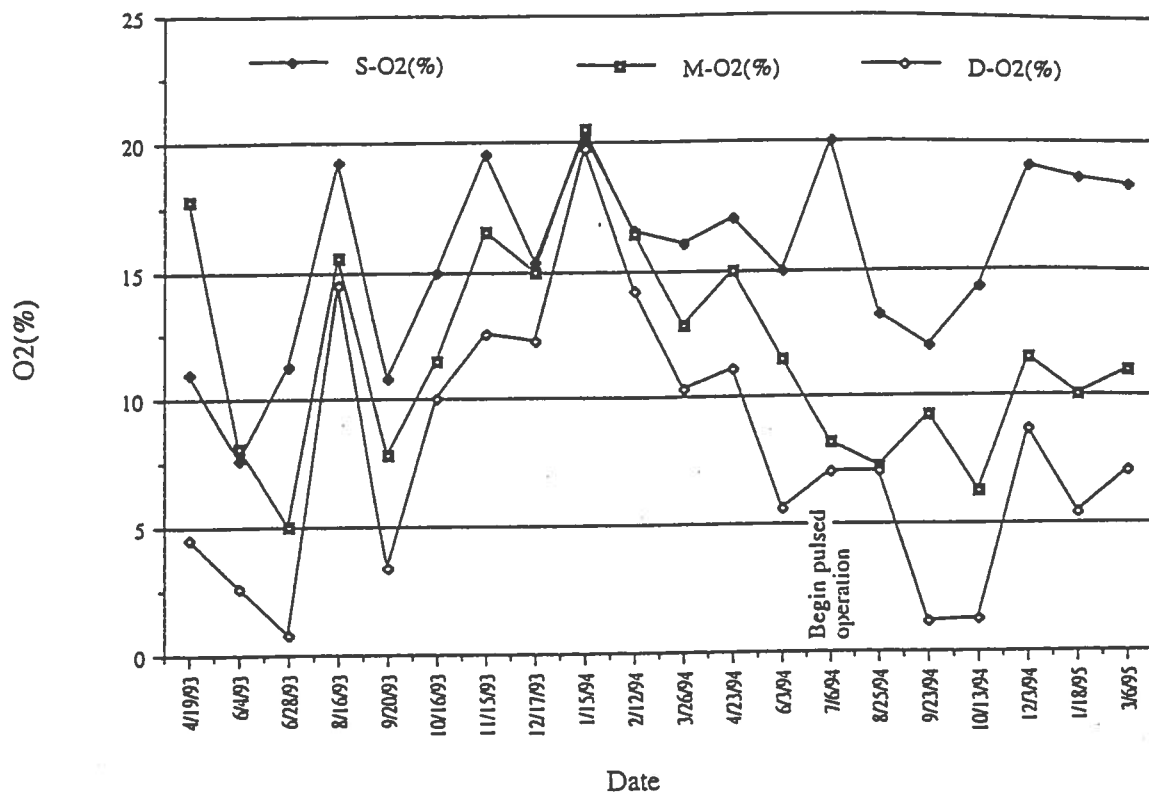


### **APPENDIX 33**

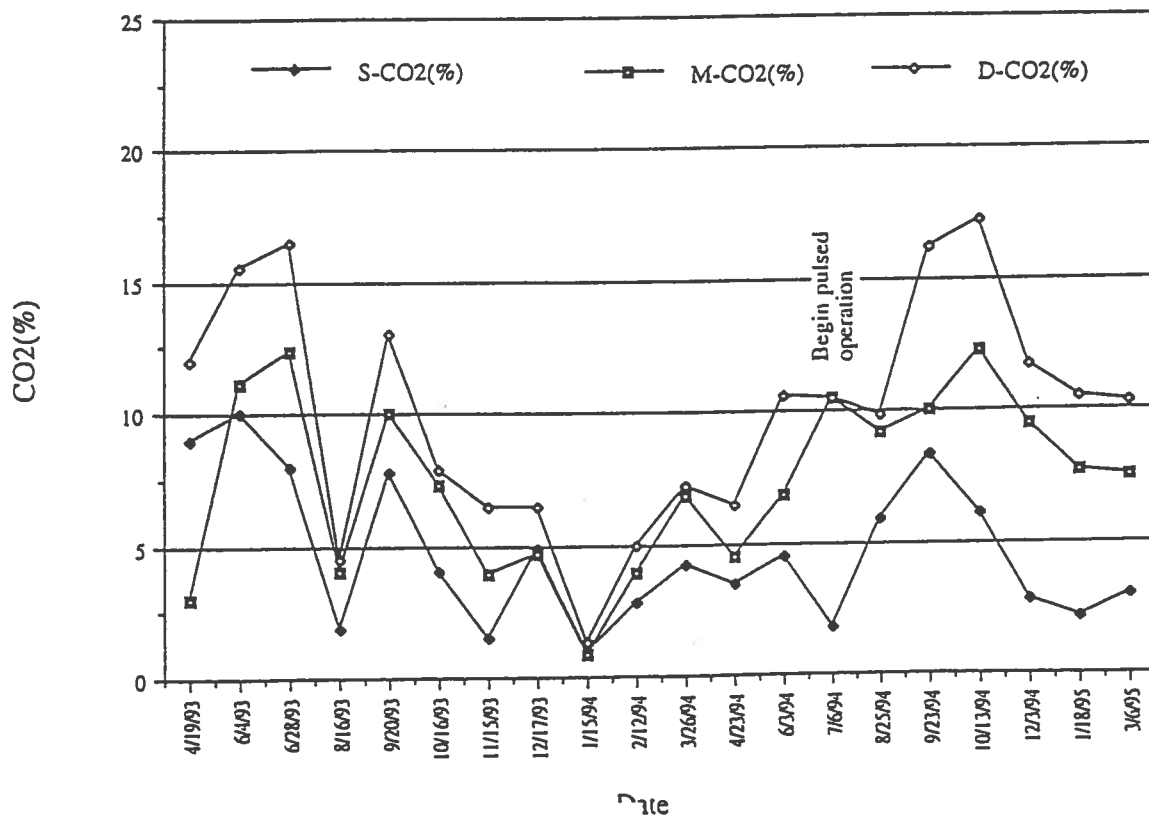
#### **PLOTS OF O<sub>2</sub> AND CO<sub>2</sub> CONCENTRATIONS AT MONITORING POINTS AFFECTED BY PULSED AIR INJECTION**

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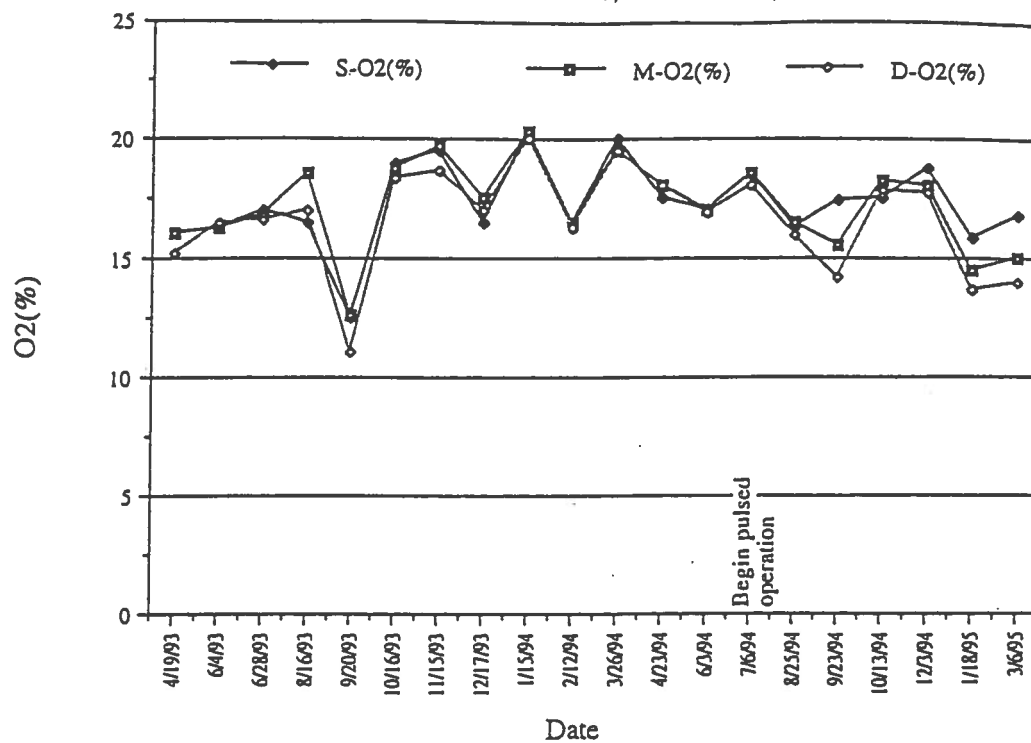
Measured O<sub>2</sub> Concentrations at MP-5, FPTA No. 1, FE Warren AFB



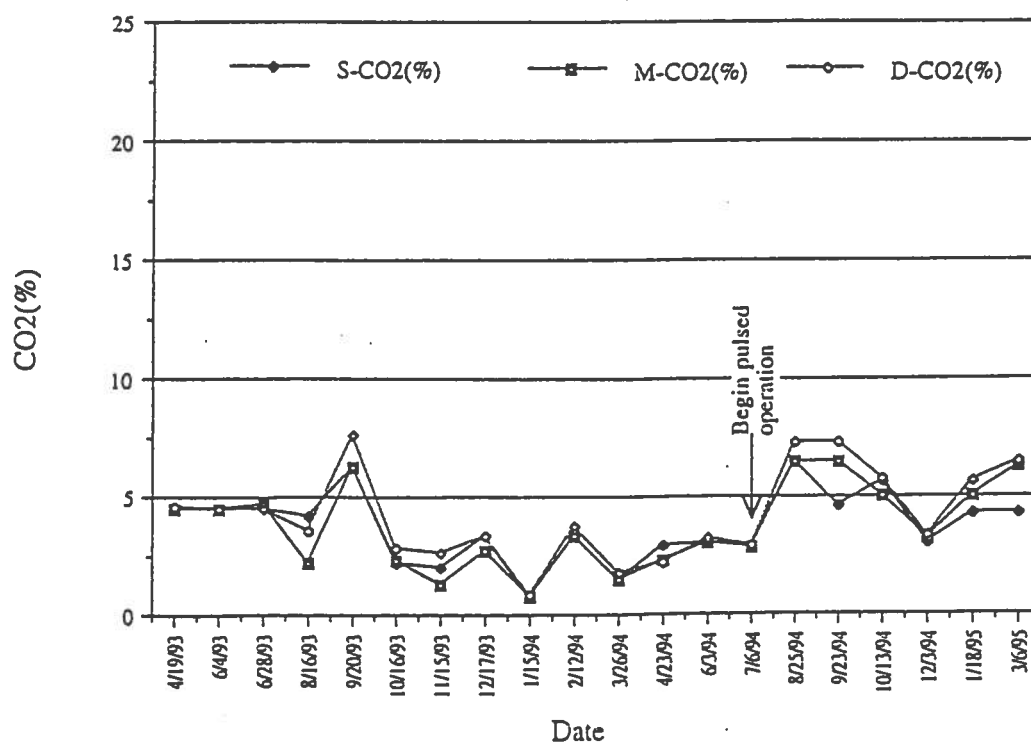
Measured CO<sub>2</sub> Concentrations at MP-5, FPTA No. 1, FE Warren AFB



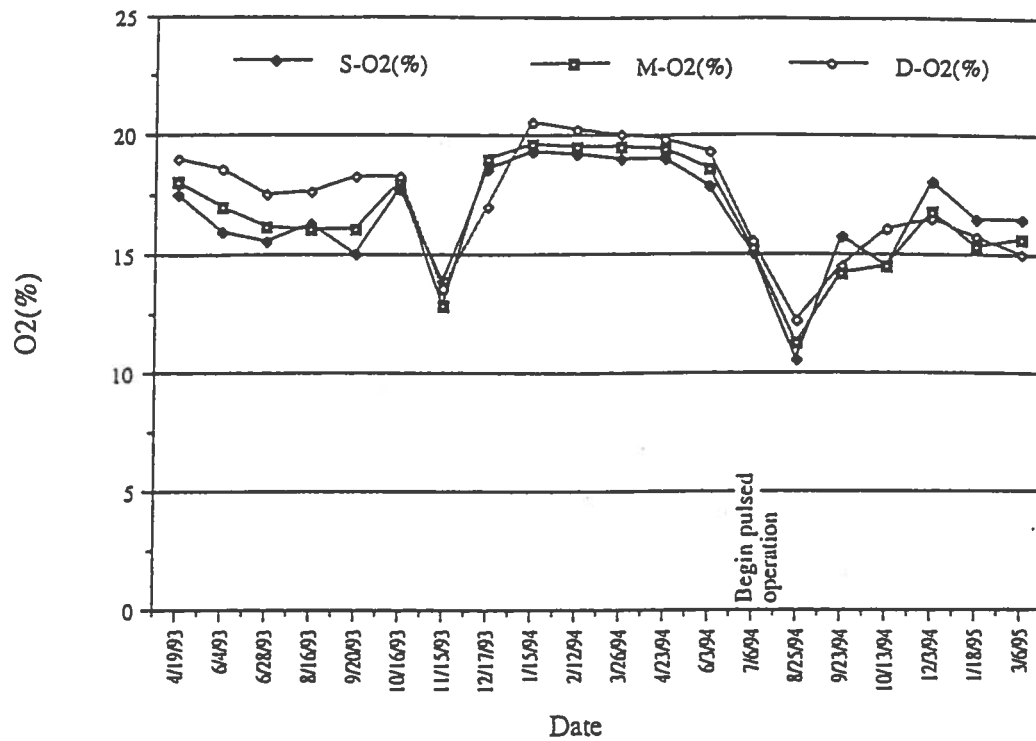
Measured O<sub>2</sub> Concentrations at MP-6, FPTA No. 1, FE Warren AFB



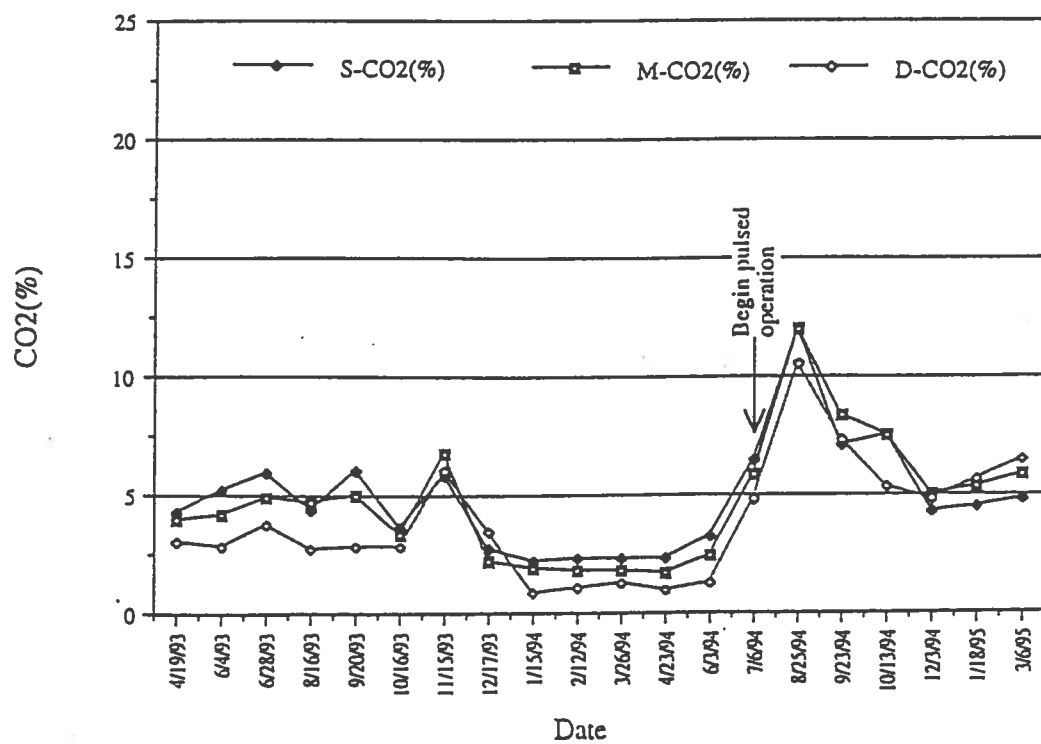
Measured CO<sub>2</sub> Concentrations at MP-6, FPTA No. 1, FE Warren AFB



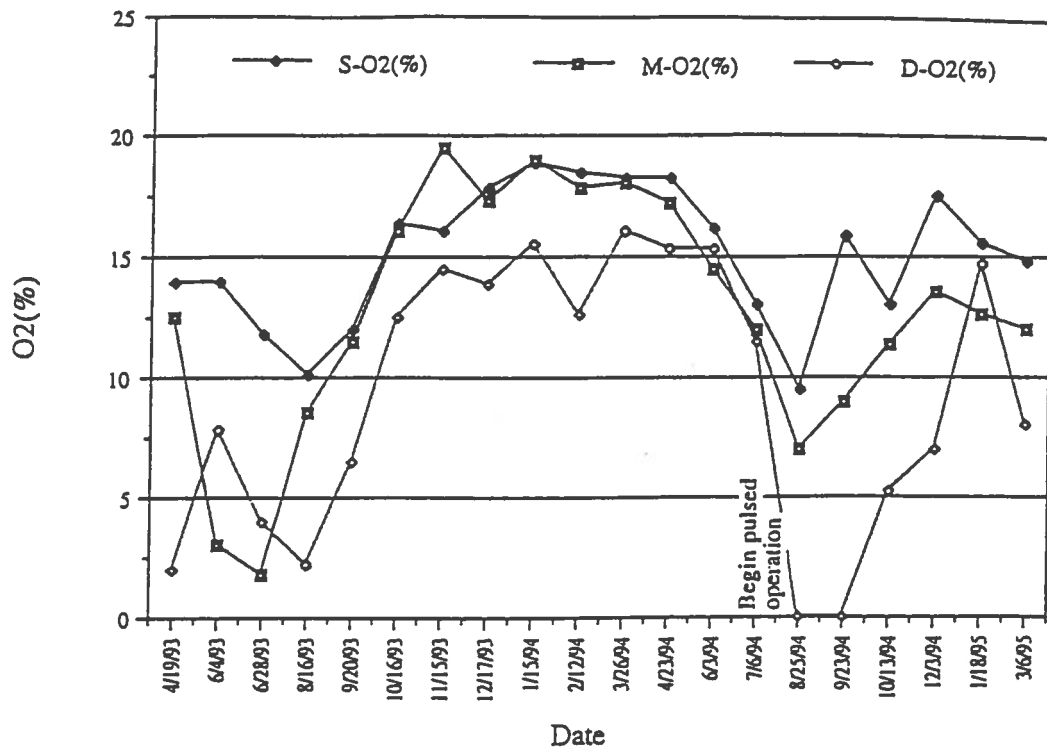
Measured O<sub>2</sub> Concentrations at MP-10, FPTA No. 1, FE Warren AFB



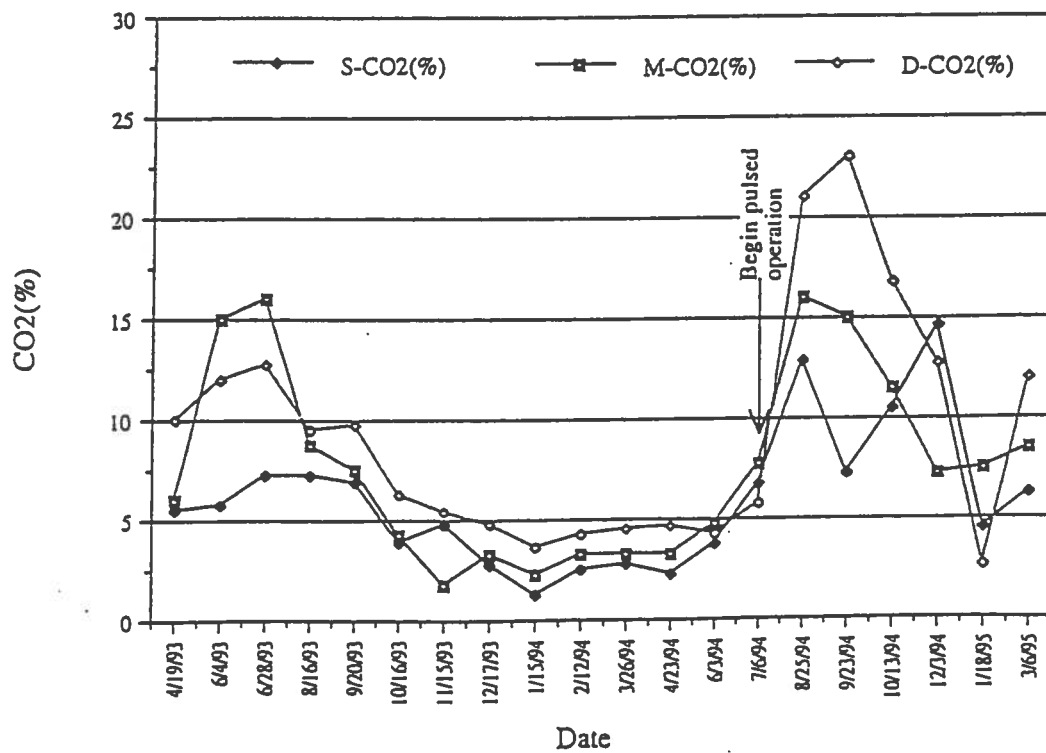
Measured CO<sub>2</sub> Concentrations at MP-10, FPTA No. 1, FE Warren AFB



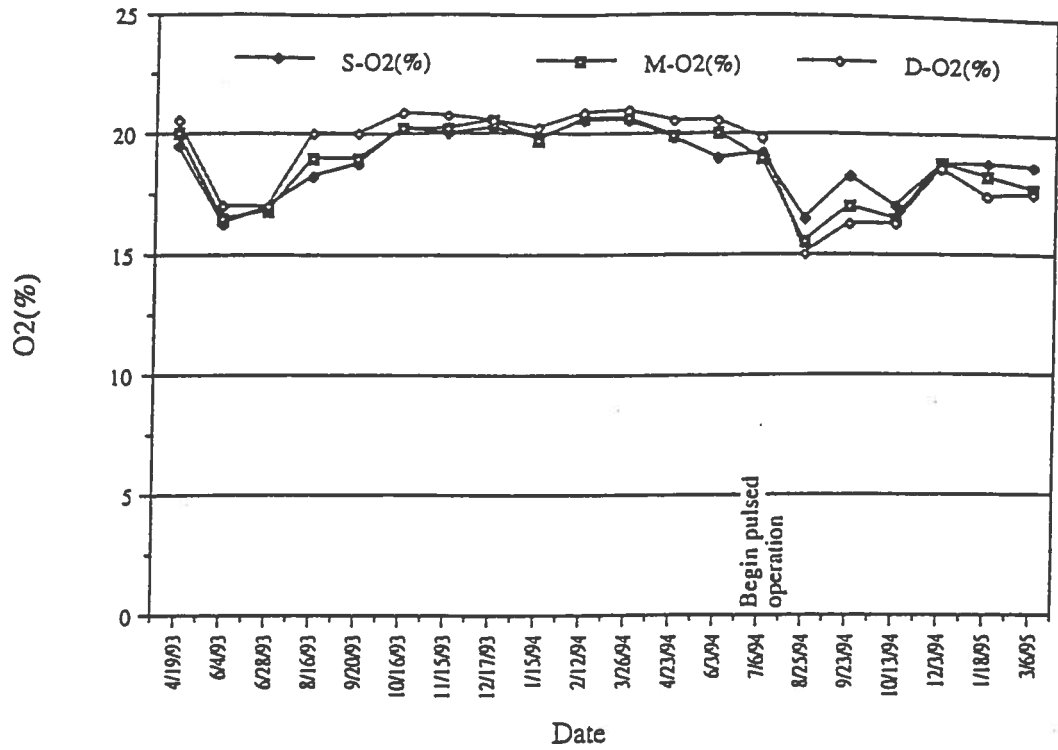
Measured O<sub>2</sub> Concentrations at MP-11, FPTA No. 1, FE Warren AFB



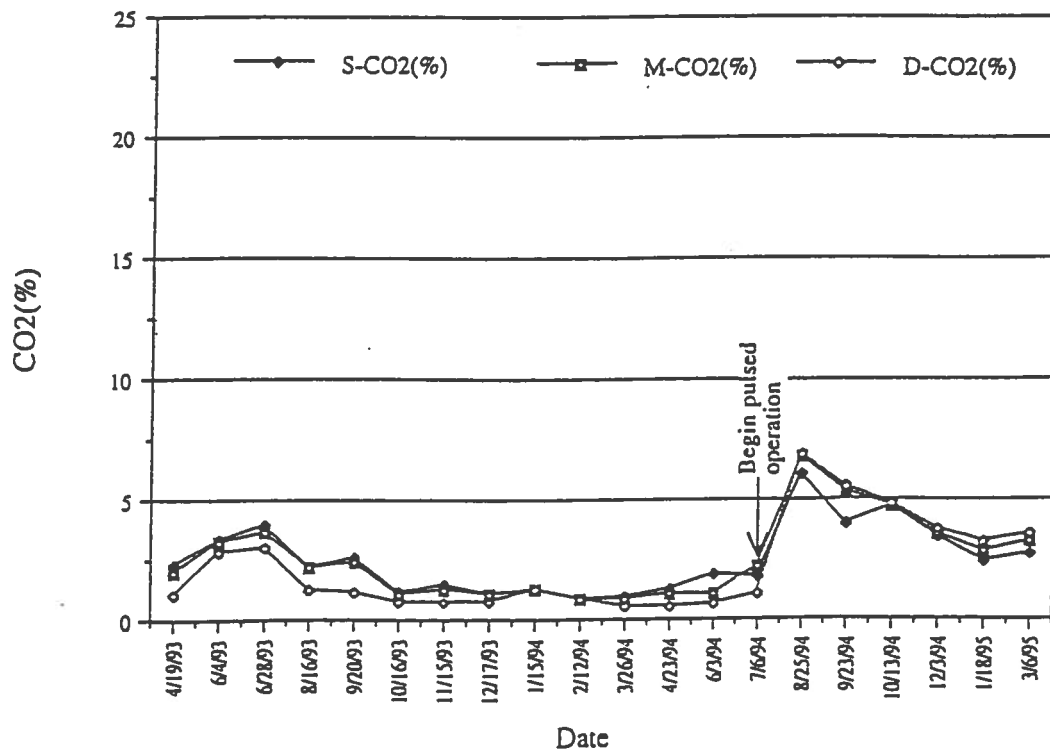
Measured CO<sub>2</sub> Concentrations at MP-11, FPTA No. 1, FE Warren AFB



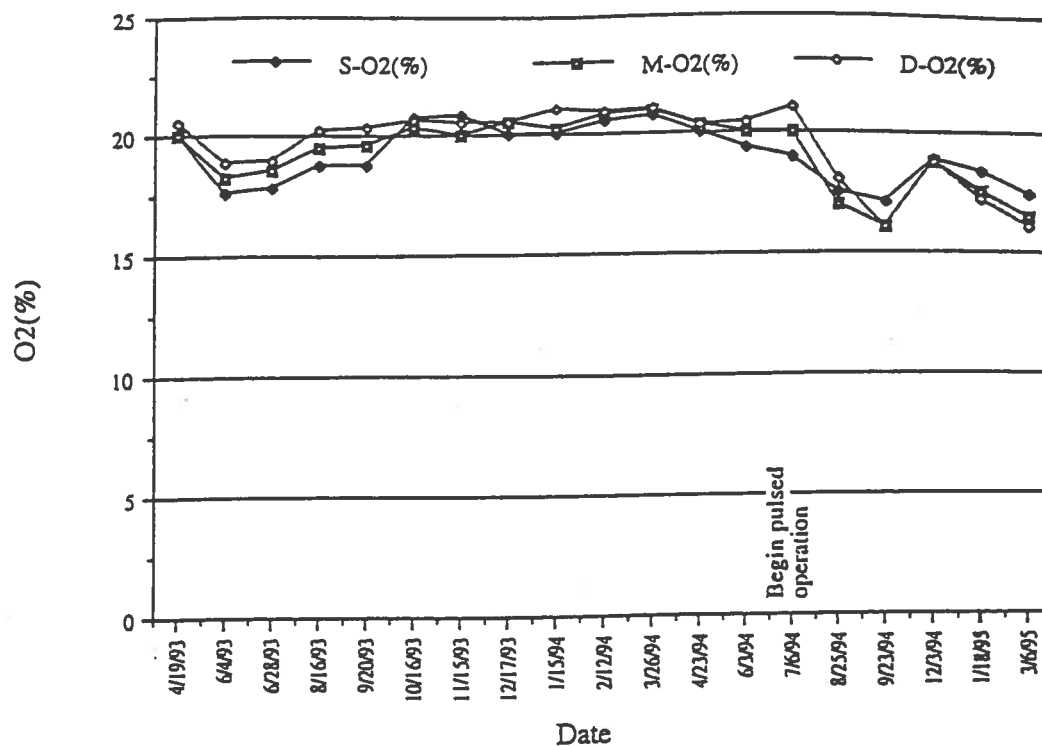
Measured O<sub>2</sub> Concentrations at MP-15, FPTA No. 1, FE Warren AFB



Measured CO<sub>2</sub> Concentrations at MP-15, FPTA No. 1, FE Warren AFB



Measured O<sub>2</sub> Concentrations at MP-16, FPTA No. 1, FE Warren AFB



Measured CO<sub>2</sub> Concentrations at MP-16, FPTA No. 1, FE Warren AFB

